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PROTECTION OF MARINE AND COASTAL WATERS

JOINT HEARINGS

BEFORE THE

SUBCOMMITTEE ON
SUPERFUND, OCEAN, AND WATER PROTECTION

AND THE

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION

OF THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

FIRST SESSION

ON

S. 587, S. 588, S. 1178, AND S. 1179

BILLS CONCERNING RESEARCH AND PROTECTION OF MARINE AND COASTAL WATERS

JULY 12, AND 25, 1989—WASHINGTON, DC
AUGUST 11, 1989—PORTLAND, MAINE

(JOINTLY WITH THE SUBCOMMITTEE ON OCEANOGRAPHY, U.S. HOUSE OF REPRESENTATIVES)

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PROTECTION OF MARINE AND COASTAL WATERS

WEDNESDAY, JULY 12, 1989

U.S. SENATE, COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, SUBCOMMITTEE ON SUPERFUND, OCEAN, AND WATER PROTECTION, AND SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION,

Washington, DC.

The subcommittees met, pursuant to notice, at 9:38 a.m., in room 406, Dirksen Senate Office Building, Hon. Frank Lautenberg [chairman of the Subcommittee on Superfund, Ocean and Water Protection] presiding.

Present: Senators Lautenberg, Baucus, Chafee, Mitchell, Graham, and Lieberman.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. Good morning, this is a hearing of two subcommittees, the Subcommittee on Superfund, Ocean, and Water Protection and the Environmental Protection subcommittee, chaired by my distinguished colleague, Senator Baucus.

Today will be the first of two days of hearings on four bills that are designed to protect our coastal and ocean waters.

These bills are S. 1179, the Comprehensive Ocean Assessment and Strategy Act or COAST, which I introduced; S. 1178, the Marine Protection Act; S. 587, the Marine Research Act, and S. 588, the Marine Research Funding Act, all of which were introduced by Senator Mitchell.

These bills were cosponsored by Senator Chafee, the committee's ranking minority member, and numerous other members of the committee and the Senate.

We have introduced this legislation because of our concern about the health of our ocean and coastal waters.

The marine environment supports tourism, recreation, and commercial and recreational fishing. It generates tens of billions of dollars worth of economic activity annually and it provides immeasurable enjoyment for our citizens, yet it is clear that these resources are at risk.

We see it in many ways. We see it in the harbor seals in the Gulf of Maine, who have the highest pesticide level of any U.S. mammal on land or in the water.

We see it in sea turtles and sea birds, who are choked or strangled on plastic debris in the ocean.

We see it in shellfish beds and diseased fish.

It is obvious in garbage and medical waste deposits on our shores, closing our beaches and ruining vacations and injuring our tourist economy.

The Congress is fighting back and this committee has taken the initiative to pass legislation to end ocean dumping of sewage sludge, to reauthorize and strengthen the Clean Water Act, to ban the dumping of plastics in the oceans, and to track medical wastes.

We are seeing some positive results of these efforts in my State. Fish are returning to rivers, and also once again inhabiting former dumping grounds.

Over 15,000 acres of sea will soon be reopened for shellfishing because of improved water quality.

Portions of the Hudson River, a highly polluted and contaminated river, are soon going to be swimmable again, and over the holiday weekends, we have seen some of the largest crowds we have seen in many years return to our seashore.

So we have reason to be encouraged. When we come to the defense of Nature, Nature responds. But our work is not done.

According to OTA, the overall health of our coastal waters is still in decline, and without additional steps, there will be new or continued assaults on our ocean.

That is why the bills we are considering today are so important. These bills adopt many of the recommendations made by OTA and by others. They establish a comprehensive effort to restore and maintain the health of our coastal waters.

Senator Mitchell's Marine Research Act will provide increased scientific research and assessment of our Nation's coastal environment.

Both bills, S. 1178 and S. 1179, will help to reduce coastal pollution from industrial plants, sewage treatment facilities, combined sewer overflows, storm water discharges, and nonpoint sources of pollution.

I look forward to hearing from today's witnesses, and I am pleased to have with us a colleague of mine from New Jersey, Congressman Frank Pallone, whose district has a significant shoreline.

He has already established himself as a leader on coastal issues, and he is with us today.

But first, before we call on Congressman Pallone, I would ask my colleague, and again, Chairman of the Environmental Protection Subcommittee, Senator Baucus, if he has an opening statement.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. Thank you, Mr. Chairman.

Good morning, ladies and gentlemen.

This is the first of two hearings on legislation to expand and strengthen research and protection of our marine and coastal waters.

I commend Senator Lautenberg, the Senator from New Jersey, who has gone a long way toward not only introducing but passing legislation which begins to address a lot of our marine and coastal pollution problems. This committee is, as he says, a joint hearing held both by his subcommittee and by the Environmental Protection Subcommittee, which I chair.

My own State of Montana is blessed with many resources, a wide range of natural resources, but we do not have marine or coastal resources.

Like many of our inland neighbors, however, we in Montana recognize the environmental and the economic values of marine and coastal waters, and we share the conviction that this resource must be protected for future generations.

We have natural resources in our State that must be protected for future generations. Certainly marine and coastal waters likewise must be protected in the same way.

For the past several years, we have seen a steady increase in the evidence of environmental problems in coastal waters. For example, the Office of Technology Assessment warned in 1987 that, and I quote, "In the absence of additional measures to protect our marine waters, the next few decades will witness new or continued degradation in many estuaries and coastal waters around the country."

The OTA report described the seriousness and the extent of the coastal pollution problems and pointed to the myriad or pollution sources, including point source discharges from industry, limited sewage treatment by coastal communities, and nonpoint sources of pollution, including runoff from city streets, agricultural lands, and construction sites.

I am pleased that the author of the OTA study will be testifying later this morning.

Since publication of the OTA report, coastal pollution unfortunately has increased. Last year, we learned of the threat to our beaches from improper management of medical wastes, and this year, we are repeatedly reminded of the tragic consequences of major oil spills.

We are making some progress. Under Senator Lautenberg's leadership, the Congress passed legislation to ban the ocean dumping of sewage sludge by 1991.

I worked with Senator Lautenberg and others last year to develop pilot programs for medical waste management, and I expect that the Environmental Protection Subcommittee will report legislation later this year to improve programs for preventing and responding to oil spills.

These are important initiatives, but it is clear that in the long run we need comprehensive and coordinated legislation to deal with the many incremental and cumulative sources of coastal pollution and to improve research of our coastal waters.

I think the legislation before us today, developed by Senators Mitchell and Lautenberg, addresses these important objectives. I am especially interested in proposed amendments to the Clean Water Act. A number of these amendments, such as those which focus management and regulatory problems on specific water bodies, expand the water quality standards program, and address the problem of combined sewer overflows, may be appropriate for broader application when we consider full reauthorization of the Clean Water Act in the next Congress.

I express my appreciation to the witnesses today who have come to testify. We have their views, which are important to this proceeding, and I look forward to working with the committee and also with those witnesses who are contributing valuable information.

Thank you, Mr. Chairman.

Senator LAUTENBERG. Thank you very much, Senator Baucus.

The fact that Montana does not have coastline has not in any way ever deterred you from your pursuit of a better environment, of the preservation of our streams and ground water.

Everyone knows that what happens to the water in Montana and the water in Rhode Island and the water in New Jersey ultimately gets to effect everyone.

Senator BAUCUS. We do not have an ocean, Mr. Chairman, but I must tell you, we have the largest natural freshwater lake west of the Mississippi.

Senator LAUTENBERG. And we all accept your invitation to visit your State and to be taken to the best trout streams and things of that nature.

Senator BAUCUS. Come in July and August.

Senator LAUTENBERG. Thank you very much, Senator Baucus.

Senator Chafee is the ranking member of the Committee. He has had an active interest in protecting the quality of our oceans and our marine life.

We welcome any opening statement you have, Senator Chafee.

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator CHAFEE. Thank you very much, Mr. Chairman.

First of all, I want to thank you and commend you for holding these hearings, because of your long active interest in the oceans and the entire environment, and I also would like to thank the chairman of the subcommittee I serve on, Senator Baucus, for his interest in these matters.

As you mentioned, Senator Baucus' State is a long way from the ocean, but his concern for the environment encompasses the entire environment, even though it does not directly affect his State.

So I want to thank him and commend him also for his long active and able interest in these matters.

Mr. Chairman, I am glad we are looking at this. The estuaries and the bays are under severe stress. Carolyn Karp is here today and will be a witness. She is the director of the Narragansett Bay Estuary Study, and I met with her last week at home, and she can make a real contribution to our attempt to understand these problems.

The fisherman are alarmed by declining catches. Average citizens are disgusted by the coastal pollution and trash which is appearing.

I think we are going to discover, when we get into wrestling with these matters, that it is going to take tough decisions, particularly involving those on the lands adjacent to our estuaries. That is where the problem lies.

There is only so much that that land can stand, as far as construction, as far as sewage disposal, and other attempts for disposal. If we do not preserve some of the areas close to our estuaries and bays, then the bays and estuaries are going to be very badly affected.

So we are going to focus today on four bills, and I look forward to this testimony. I want to again thank you, Mr. Chairman.

[Senator Chafee's written statement follows:]

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

I want to thank the chairman of the Environmental Protection Subcommittee, Senator Baucus, and the chairman of the Superfund, Oceans and Water Protection Subcommittee, Senator Lautenberg, for scheduling this hearing on legislation to expand and strengthen our protection of the marine environment.

We in the 101st Congress have heard a disturbing message regarding the condition of our coastal waters, bays, and estuaries. This message has not been carried solely by environmental groups, but is echoed by fishermen alarmed by declining catches of fish, by average citizens who are disgusted by the tide of coastal pollution and trash which appear with regularity on our beaches, and by objective researchers such as universities and the Congressional Office of Technology Assessment.

Essentially the message is the same: America's coastal waters are dying. The implicit conclusion is that the policies and programs at the Federal, State and local level have not been effective in adequately protecting our marine environment. At a time when the stresses on our coastal waters have never been greater, we are experiencing a decrease in funding for critical marine research and enforcement programs, and are witnessing a lack of political will to make the touch decision on land to protect our resources at sea.

Today we will hear from the author of a report by the Office of Technology Assessment. This report, entitled "Wastes in the Marine Environment", notes that an enormous amount of pollution ultimately makes its way to coastal waters. Many of these waters, the report notes, have exhibited a variety of adverse impacts, and their overall health is declining or threatened. Without stern additional measures, new or continued degredation will occur in our coastal waters.

The Office of Technology Assessment, in its report on wastes in the marine environment, also concluded that "monitoring, research and enforcement are currently inadequate . . . information gaps still constrain analyses of marine wastes disposal, partly because of a lack of information gathering in some areas of the country, lack of systematic analyses of gathered data, and ineffective dissemination of results."

In response to this critical lack of information, Senator Mitchell and I have developed legislation, S. 587, to expand and strengthen our marine and estuarine research program, the Marine Research Act of 1989. The key provision of the bill authorizes the establishment of 10 multi-State regional marine research centers. The centers would coordinate and support the activities of organizations and agencies in the region, including State agencies, universities, and other laboratories. The regional reseach centers would be designed to compliment existing research efforts, such as those being undertaken by the Sea Grant Program. The bill would authorize $29.5 million annually for each of the next 5 years.

The regional approach adopted by this legislation will encourage researchers to study specific marine ecosystems, rather than stop at the artificial borders of a particular State. Passage of this bill would allow us to answer some basic questions about status and trends, and help us keep pace with the growing threats to marine environmental quality. I look forward to hearing testimony on this proposal.

Today we will focus on four bills designed to address the problems of our near-coastal waters. I am particularly pleased that Carolyn Karp, project manager of the Narragansett Bay project, is here to give us her perspective as manager of a major project of the National Estuary Program. As the 5-year studies of the National Estuary Program draw to conclusion, we must make certain that these do not become idle documents that sit on shelves collecting dust. The recommendations contained in these studies must be quickly implemented in order to realize long-awaited improvements in water quality. I look forward to a productive and informative hearing.

Senator LAUTENBERG. Thank you, Senator Chafee.

I am pleased at this point to invite a colleague from the other body, Frank Pallone.

Frank Pallone is a new and very effective Congressman. He has a principle interest in a better environment.

He had a record as a State senator of very progressive thinking when it came to dealing with our oceans, our beaches, and our environmental problems.

We are glad to see you with that continued interest, and invite you now to give your testimony.

STATEMENT OF HON. FRANK PALLONE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. PALLONE. Thank you, Mr. Chairman.

I was thinking that this is the first time that I am referring to you as Mr. Chairman, because it is the first time I have appeared before your subcommittee. I am very pleased to be here today, and thank you for those kind words.

I just wanted to say initially that I believe that these bills, and particularly your coast initiative which I am most familiar with, are perhaps the most important legislative package that we are going to face—certainly with regard to my congressional district—not only in this Congress, but in the future years.

This is primarily because it is an effort to deal with the coastal pollution problem in the long term and in a larger sense. And that is what I have been saying to my constituents when I talk about the coast initiative.

In many ways, what I am trying to be is a salesman, if you will, for the initiative in New Jersey, particularly in Monmouth County and along the Jersey Shore.

I want to report to you that in talking to a number of environmental groups and talking to some editorial boards over the last month or so, the Coast Initiative has been very well received. Basically, the environmental groups which you know are very active at the Jersey Shore—you have been involved with them—have been looking for some time for a comprehensive package that deals with the coastal pollution problem, not only with point sources, but with nonpoint sources, with combined sewer overflows, with storm water treatment and management—all the things that we know ultimately we must get at, if we are to have an effective attack on the coastal pollution problem.

Whether it is Ocean County or Monmouth County, both of which I represent, the feedback has been very positive.

I wanted to first thank you also for allowing me to sponsor the coast initiative on the House side. We are gathering sponsors, not only in New Jersey, but in the other surrounding coastal States, and so far, that process has also been going very well.

You mentioned initially—and I just want to touch upon briefly—the fact that this summer has been considerably better. I am amazed by the fact that the ocean water quality in New Jersey, in my district, is significantly better this summer.

The crowds are there, and we have not had any major incidents. I have to say in part, I believe that that is because of the legislative enactments, some of which you have mentioned, the enforcement actions that have been taken by Federal and State agencies. These have made it possible for this summer to be better.

You mentioned two bills—the bill that would ban the ocean disposal of sludge by 1991, and also the medical waste tracking bill, both of which I believe you sponsored, and there is no question that that legislation is being implemented. I believe it is already having certain effects, particularly with regard to the medical wastes.

At the same time, the enforcement measures, which I know you have been very active in trying to get, both the Federal EPA, and the Army Corps and the Coast Guard together, to have better enforcement this summer—which we now have.

With additional helicopter surveillance, boats out there watching for slicks and floatables—all those things really are making a difference.

But the bottom line is that we need to get at the long term solution, if you will, to the coastal pollution problem, and I really think that is what this coast initiative is all about.

Let me say that I believe the most important part of it, perhaps, is that part that deals with the combined sewer overflows. You know that off the coast of New Jersey, the visible problems—the floatables, the plastics, the garbage—those are the things that I think are of particular concern to tourism, to the local economy, to people's perceptions about ocean water quality. And we are really not going to get to those until we deal with the combined sewer overflows.

I think that your coast initiative really deals most importantly with that, trying to set the stage to say ultimately that we have to separate. We cannot have combined sewers—but at the same time trying to deal on an interim basis, trying to come up with measures, whether they be screening devices or cleansing devices, or different things that can be done on an interim basis to deal with combined sewer overflows, to try to prevent the material from getting into the ocean.

Those are the things that a lot of the environmental groups have been talking about for some time, and I believe that this bill will accomplish that.

The other thing I wanted to mention is water quality standards in the bill. In the coast initiative, it establishes that there will be strict standards with regard to certain toxic elements, or different elements that are getting into the ocean water.

The bottom line is, the bill even specifies those specific elements for which there will be specific standards. That is very important. I do not think there is any question in the public's mind that we have to actually improve the quality of the water itself.

It is nice to talk about medical waste, and, of course, floatables. We know they are important. But the actual ocean water quality is just as important, ultimately, if we are going to look at the health effects and what it means to our fish, what it means to the wildlife, and what it means ultimately down the food chain to human beings.

This bill also seeks to get at that.

The other thing that the bill deals with most effectively, I think, is pretreatment. On the State level, I was the sponsor, actually, as part of our Coastal Pollution Package, or anti-pollution package, last summer, of a bill that would deal with the pretreatment issue.

The bottom line is that we are not going to be able to deal effectively with either the sewage sludge problem or any of the problems related to municipal sewage treatment, unless we deal effectively with pretreatment.

And you are saying specifically in the bill that pretreatment is a priority, that sewage authorities have to be on schedules, that pretreatment guidelines and deadlines have to be met.

The other thing is, it is a major initiative there with regard to monitoring. I do not think there is any question that monitoring and surveillance with regard to what is going on out there is very important, and the realization that the Federal Government should take a role in that monitoring and surveillance is a very important aspect as well.

And finally, I wanted to mention the nonpoint source. You know that on a long term basis, we have to deal with nonpoint sources of pollution, and I know for example, at the Jersey Shore, we have a pilot program which again you have been involved with, on the Navasink River, to try to get at those nonpoint sources and deal with them effectively, whether it comes from agricultural runoff, or from overdevelopment—which is again a major issue with the shore.

There again, this bill is seeking to deal with those nonpoint sources of pollution. There are also significant new penalties in the coast initiative, which I think is very important.

Overall, I guess I would end by saying that the significance of it in my opinion more than anything else is in this so-called long term strategy.

When I talked to a number of the environmental groups at the shore, what they basically see is this bill and the package of bills that is before the subcommittee today as kind of a new wave to deal with the ocean pollution problem.

We have tried to deal with the sludge, we have tried to deal with the medical waste and the legislation that is in place is effectively going to deal with that. Of course, we have been spending money on upgrading sewage treatment plants from primary to secondary, and perhaps even eventually beyond that.

But I think the feeling is that we cannot just attack the problem individually from different sources. We have to rather look at the overall situation with regard to ocean water quality, and what can be done in that respect, and that is what this bill really gets at.

That is why I think it is more significant, and that is why I want to commend you and the rest of the members of the committee for not only introducing the bill, but also trying to move on it fairly quickly.

I intend to try to do the same thing in the other House, even as a freshman, to the best of my ability. As you know, you had the press conference, and these bills on the House side are being sponsored by some Members who are in key leadership positions. So I think we are going to see successful action over there as well.

Thank you for inviting me today.

Senator **Lautenberg**. Thank you for that testimony, Congressman. We are happy to have your endorsement and happy to have your sponsorship on the House side.

We know that even the best of bills needs good hands to guide them through the process, and we are happy that you are going to have an opportunity to do that.

We are pleased to have with us the Majority Leader and senior member of this committee, Senator Mitchell.

Senator Mitchell, we would invite you to make any opening statements, if you would like to do so.

Senator **Mitchell**. Thank you, Mr. Chairman.

I have a few minutes, and I would just as soon defer to permit Representative Pallone to take any questions and leave, and then I will make my statement between him and the next panel.

Senator **Lautenberg**. That is very kind.

We appreciate that.

Does anyone have any questions of Congressman Pallone?

Apparently not. We thank you once again for your testimony.

Mr. **Pallone**. Thank you, Senator.

Senator **Lautenberg**. And now, Senator Mitchell.

OPENING STATEMENT OF HON. GEORGE J. MITCHELL, U.S. SENATOR FROM THE STATE OF MAINE

Senator **Mitchell**. Thank you, Mr. Chairman, for giving me this opportunity.

I will not be able to stay for the hearing, because I have to be on the Senate floor in a few minutes, but I ask that my full statement be placed in the record.

Senator **Lautenberg**. Without objection.

Senator **Mitchell**. I begin by expressing my appreciation to you, Mr. Chairman, and to Senator Baucus, the chairman of the other subcommittee, for scheduling and conducting these hearings. I look forward to working with you to develop the best possible legislation to protect our marine and coastal waters.

This is an essential effort if we are to ensure that this important resource is protected for future generations. Our marine and coastal waters face an unprecedented number of environmental threats, and in some cases, their quality is declining.

Last summer, beaches were closed throughout the Northeast after the discovery of medical waste and other forms of pollution.

There is a large dead zone in the Gulf of Mexico.

Lobsters taken off the mid-Atlantic coast have burn holes as a result of pollution.

Shellfish in the Chesapeake Bay and coastal North Carolina have been affected by pollution and disease.

We face huge clean-up problems in East Coast harbors, including Boston Harbor.

And on the West Coast, toxic chemicals and other heavy metals are in the sediments of Puget Sound, San Francisco Bay, and Santa Monica Bay.

As Chairman of the Environmental Protection subcommittee during the last Congress, I chaired a number of hearings assessing coastal pollution problems. The subcommittee investigated the national scope of coastal pollution, the need for improved marine research, the problem of ocean dumping of sewage sludge, the progress of pollution control programs in the Chesapeake Bay, and environmental conditions in the Gulf of Maine.

The results of these hearings, the growing evidence of serious marine pollution problems from every coastal region of the country, the extensive beach closings last summer, and the recent disaster in Alaska combine to make a compelling case that we must expand and strengthen programs for the protection of our coastal waters.

Last month, I introduced legislation in the Senate to expand and strengthen programs for the protection of marine and coastal waters, S. 1178.

The key element of the bill would expand the National Estuaries program, and more specifically identify threatened coastal waters and to focus management and regulatory efforts on these waters.

The bill also establishes a process for eliminating overflows of combined storm and sanitary sewers in coastal areas, expands programs for control of nonpoint sources of coastal pollution, and strengthens water quality standards for marine waters.

Another key objective of the bill is to strengthen programs for assessment and management of contaminated marine sediment. The bill would amend existing statutes to establish specific numerical standards for toxic contaminants in marine sediments, and establish more stringent requirements for assessment and management of contaminated marine sediments.

This bill builds on legislation I introduced earlier this year to expand research in marine waters. The Marine Research Act, S. 587, provides for the development of marine research programs focusing on the major coastal regions of the country.

Marine research institutions in each region would develop long range marine research plans, and would be eligible for grant assistance to support implementation of research programs.

Mr. Chairman, and members of the committee, we confront not only a serious present-day problem, but the potential for a grave crisis in the future, and I look forward to working with all of the members of the committee to develop the best possible approach to dealing with the problem and the crisis.

Thank you, Mr. Chairman.

[Senator Mitchell's statement follows:]

OPENING STATEMENT OF HON. GEORGE J. MITCHELL, U.S. SENATOR FROM THE STATE OF MAINE

Our marine and coastal waters are a natural resource of tremendous environmental and economic importance. Unfortunately, these waters face an unprecedented number of environmental threats and, in some cases, their quality is declining.

Last summer, beaches were closed throughout the Northeast after the discovery of medical waste and other pollution problems. There is a large "dead zone" in the Gulf of Mexico. Lobsters taken off the mid-Atlantic coast have large "burn holes" as a result of pollution. Shellfish in Chesapeake Bay and coastal North Carolina have been decimated by pollution and disease. We face huge clean-up problems in East Coast harbors, including Boston Harbor. And, on the West coast, toxic chemicals and other heavy metals, are in the sediments of Puget Sound, San Francisco Bay, and Santa Monica Bay.

As Chairman of the Environmental Protection Subcommittee during the last Congress, I chaired a number of hearings addressing coastal pollution problems. The

Subcommittee investigated the national scope of coastal pollution, the need for improved marine research programs, the problem of ocean dumping of sewage sludge, the progress of pollution control programs in the Chesapeake Bay, and environmental conditions in the Gulf of Maine.

The results of these hearings, the growing evidence of serious marine pollution problems from every coastal region of the country, the extensive beach closings last summer, and the recent disaster in Alaska make a compelling case that it is time to expand and strengthen programs for the protection of our coastal waters.

Last month, I introduced legislation in the Senate to expand and strengthen programs for the protection of marine and coastal waters, S. 1178. A key element of the bill would expand the National Estuaries Program to more specifically identify threatened coastal waters and to focus management and regulatory efforts on these waters. The bill also establishes a process for eliminating overflows of combined storm and sanitary sewers in coastal areas, expands programs for control of nonpoint sources of coastal pollution, and strengthens water quality standards for marine waters.

Another key objective of the bill is to strengthen programs for assessment and management of contaminated marine sediment. The bill would amend existing statutes to establish specific, numerical standards for toxic contaminants in marine sediments and establish more stringent requirements for assessment and management of contaminated marine sediments.

This bill builds on legislation I introduced earlier this year to expand research of marine waters. The Marine Research Act, S. 587, provides for the development of marine research programs focusing on the major coastal regions of the country. Marine research institutions in each region would develop long range marine research plans and would be eligible for grant assistance to support implementation of research programs.

I want to express my appreciation to Senators Lautenberg and Baucus for scheduling these important hearings. I look forward to working with them in developing the best possible legislation to protect our marine and coastal waters. This effort is essential if we are to assure that this resource is protected for future generations.

Thank you.

Senator LAUTENBERG. Thank you very much, Senator Mitchell.

I, too, look forward to working with you on solving the problem. How we get there is not quite as important as arriving at a solution.

Senator Graham, do you have a statement you would like to make?

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Senator GRAHAM. Mr. Chairman, I wish to join in commending you and Senator Baucus for holding these hearings.

I have a prepared statement which I would submit for the record.

[Senator Graham's statement follows:]

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Chairmen, I appreciate the hard work by Senators Mitchell and Lautenberg that has gone into drafting the four bills we will be discussing today and I welcome the opportunity to hear testimony on this coastal protection legislation.

Coastal pollution has been increasing dramatically and we in Florida are particularly cognizant of the problem—being surrounded by ocean on three sides. While it is this very ocean that provides the quality of life and much of the setting for industry in Florida, it is the degradation of this ocean that can turn the tide of industry and environmental quality in our State.

By expanding the National Estuaries Program, by establishing more stringent discharge standards, by assessing sources of toxic loading, and by establishing regional research programs, we are taking measures to prevent further pollution and to mitigate that which we are already experiencing.

I am pleased to be a cosponsor of the four bills we are discussing today and look forward to hearing from witnesses on this necessary legislation.

Senator **LAUTENBERG**. Thank you very much.

We would now like to call the first panel of witnesses, Mr. Howard Levenson and Mr. Charles Ehler.

Thank you very much for being with us. I would announce that the written testimony of all witnesses will be entered into the record and we would appreciate if you all kept your oral presentations to five minutes.

We would first invite you, Mr. Levenson, to begin.

STATEMENT OF DR. HOWARD LEVENSON, PROJECT DIRECTOR, OCEANS AND ENVIRONMENT PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT

Mr. **LEVENSON**. Thank you, Mr. Chairman.

OTA's study on waste and marine environments was issued in April of 1987, and as you have already noted, our major finding was that many estuaries and coastal waters around the country will continue to degrade or begin to do so unless we take some additional measures.

We also question whether enough of the "needy" water bodies around the country will receive adequate management.

So, I want to congratulate you and the members of the committee for developing major legislation to address these problems. Although some positive steps have been taken since OTA's report was released, unfortunately our conclusions have not changed, and indeed events during the last couple years have confirmed them.

Today, I will very briefly describe those problems. You have already alluded to them and also how the legislation being considered today supports a more protective approach.

Of course, estuaries and coastal waters have been used for years for waste disposal. Such disposal has been cheap, and it has solved at least some short-term problems on shore.

But at the same time, these waters are the most important of all marine waters. They are extremely productive, and everybody has become concerned about the impacts of waste disposal on tourism, harvests, and associated property values.

OTA documented numerous examples of impacts on these waters: fish kills, contamination of sediments and organisms, restrictions on shellfishing, fishing and swimming, increased reporting of some human diseases such as viral gastroenteritis.

These and other impacts varied around the country, but no region of the country was immune from some suite of these impacts. On a national scale, the most important disposal activities contributing pollutants were industrial and municipal pipeline discharges and combined sewer overflows.

Moreover, nonpoint source pollution from agricultural lands and urban areas is a major cause of degradation in some water bodies.

Of course, concerns heightened in the summers of 1987 and 1988 because of the infamous garbage barge, the deaths of hundreds of dolphins, and the medical waste washups. This year, we have already seen medical waste washups in beaches in at least eight

States, dozens of beach closings related to sewage contamination, and the series of oil spills around the country.

In addition to these polluting activities, we cannot forget the non-polluting activities, such as the filling of wetlands, diversion or channeling of rivers, and overharvesting that we are seeing in our coastal waters. These are frequently related to the increased pace of development along our marine shorelines.

Among all of these degrading activities, polluting or non-polluting, nonpoint pollution from agricultural areas and coastal development have received the least Federal attention. Both are related to land use planning, which traditionally has been a local and State matter.

My written testimony describes the adequacy of current programs under the Marine Protection Research and Sanctuaries Act and the Clean Water Act to combat marine pollution.

In general, these programs have reduced the amounts of some pollutants, but even with full compliance, they are unlikely to protect some marine waters from degradation.

Various strategies might help to maintain or improve the health of our coastal waters. The current system under the Clean Water Act could be improved by increasing enforcement, expanding coverage to more toxic pollutants and more industrial sources, and promoting reduced generation of wastes.

S. 1178 and S. 1179 adopt this strategy. Several of the noteworthy provisions include extending the concept of water quality to other measures of environmental quality, such as sediment quality or just general habitat quality, linking permit renewals for industrial discharges with a demonstration that waste reduction measures are being fully applied, regulating combined sewer overflows, and strengthening the pretreatment provisions.

This approach also will require monitoring and research as recognized in the bills. S. 587, for example, would establish regional research programs.

If these programs are coordinated with ongoing Federal, State and academic research efforts, they could provide the essential flexibility that is needed to respond to site-specific problems.

However, strengthening the Clean Water Act and increasing research will not be sufficient in many areas because of the problems associated with runoff and increasing development.

With respect to nonpoint pollution, the legislation would help in some ways, for example, by providing technical assistance to farmers, regulating storm water discharges, and making nonpoint programs eligible for grant assistance.

However, it is unclear what allocations actually will be made to EPA and the States to implement these provisions.

In any event, in general, many areas will require more management and a more comprehensive, ecosystem oriented approach. Recognizing this, the Federal Government and the States already have developed some site-specific programs that coordinate multiple agencies and existing programs—for example, in the Chesapeake Bay and in Puget Sound and elsewhere.

This approach appears very promising, and it has been partially institutionalized in the National Estuary Program. Several commercially important degraded water bodies have been included in the National Estuary Program.

However, the process of selecting those water bodies has been very ad hoc. S. 1178 and S. 1179 directly address this by setting up a systematic process for identifying marine areas needing protection, including—and I stress this—areas likely to become degraded in the future.

They also require States to submit management strategies for each area to EPA, and require EPA to address situations where States do not.

There is one important area that the Senate bills do not address, which Mr. Chafee alluded to, and that you did also, Mr. Chairman, and that is coastal development and land use planning.

Although land use planning has been a local and State matter, the Federal Government has enacted the Coastal Zone Management Act to encourage States to develop management plans to balance economic development and environmental protection.

More could be done to strengthen this kind of approach, whether under the CZM or under various provisions of the CWA that address marine water quality.

In summary, the subcommittees have taken some very important steps to enhance our abilities to protect our valuable marine waters. Without such steps, we are likely to witness considerably more degradation of our estuaries and coastal waters, and I congratulate you for holding these hearings and for developing this legislation.

Senator LAUTENBERG. Thank you very much, Mr. Levenson.

Mr. Ehler, is it? Is that the correct pronunciation? We neglected to say that Mr. Levenson is project director of Oceans and Environmental Programs for the Office of Technology Assessment, and Mr. Ehler is the director of the Office of Oceanography and Marine Assessment at NOAA.

We invite you, Mr. Ehler, to begin and to adhere to the same rules.

STATEMENT OF CHARLES EHLER, DIRECTOR, OFFICE OF OCEANOGRAPHY AND MARINE ASSESSMENT, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Mr. EHLER. Thank you, Mr. Chairman.

I am pleased to be here today to summarize results of NOAA activities to assess long-term trends in coastal pollution, and to discuss the need to strengthen governmental capabilities at all levels to meet the challenge of improving the quality of coastal areas throughout the United States.

Since the end of March, the Exxon Valdez oil spill has illustrated dramatically the acute effects of pollution on sensitive coastal areas and their resources. In case we needed additional incentive to take action to reduce the risk of future spills and their effects on coastal environments, three other recent incidents in Narragansett Bay, the Delaware River, and Galveston Bay have raised even further public concern about coastal and environmental quality.

These incidents and others, like medical waste on East Coast beaches last summer, illustrate the immediate impact of pollution on valuable coastal environments, on marine recreation and tourism, and on local and regional economies.

However, as dramatic as these events might have been in the eyes of the American public, even more important is the less visible, systemic deterioration of coastal environmental quality from both chronic discharges of pollutants into coastal areas and the loss of important coastal habitants.

Toxic pollutants from point and nonpoint sources, nutrients from wastewater treatment plants and agricultural sources, and the continuing destruction of coastal habitats due to human activities all pose greater long-term threats to the nation's coastal resources than dramatic spills like the Exxon Valdez.

I want to emphasize that the extent of the coastal pollution problem is truly national, and not limited to a few specific coastal or estuarine areas. Solutions to the problem will require an approach that is national in scope and scale. They will require a long time to identify and implement. They will require a significant investment at all levels of Government and the private sector. There are no simple, quick, or cheap fixes to complex problems that have taken decades to create.

Coastal areas of the United States are now the home of about half of our population. This is significant, because coastal areas of the contiguous United States, including the Great Lakes, account for only about 10 percent of the total land area.

By the year 2000, population growth and associated coastal development will stress coastal areas even further. According to projections of the National Planning Association, population in the Northeastern coastal areas will grow about 10 percent by the turn of the century. However, the population of other coastal regions will grow even faster, at rates ranging from 31 to 46 percent—the latter in the Southeastern United States. Only the coastal population of the Great Lakes is expected to decrease, in this case by about four percent.

Coastal populations are large consumers of housing, water and energy. They are also, as a consequence, major producers of solid waste and waste water, and major modifiers of coastal habitats. Since coastal areas are centers of industry and commerce, they are often the final resting place for the waste generated in industrial production processes. In 1989, for example, coastal areas accounted for 28 percent of all abandoned hazardous waste sites, including 35 percent of those listed on EPA's National Priorities List.

Coastal areas will continue to be major population and economic centers into the foreseeable future, and require effective management to ensure that environmental quality does not deteriorate further.

For each of the past five years, NOAA's National Status and Trends Program has been monitoring systematically estuarine and coastal sites throughout the Nation to determine the concentration of toxic pollutants in mussels and oysters, bottom-feeding fish such as flounders, and sediments.

The program is comprised of two major field sampling projects: the NOAA Benthic Surveillance Project and the NOAA Mussel Watch Project. Through the former, since 1984 we have measured the concentration of synthetic organic compounds and heavy metals in fish and sediments at about 50 sites. Through the NOAA Mussel Watch Project, since 1986 we have measured the concentration of these same pollutants in mussels, oysters, and associated sediments at an additional 150 sites.

The NOAA Status and Trends program is the only national program that is using uniform methods to collect and analyze toxic pollutant concentrations in selected coastal fish, shellfish and sediments to produce a consistent, high-quality database with which to compare these concentrations across sites and analyze trends over time.

Sampling sites within the program are selected to be representative of general conditions of the areas in which they are located. Efforts were made to avoid sampling sites near point sources of pollution, such as outfalls from industrial or sewage treatment plants, because such hot stops are not considered to be representative of conditions within the larger water body.

With only a few exceptions, our results, which I summarize in my written statement, are not surprising. However, they do reveal the truly national extent of the problem of toxic contamination of bottom-feeding fish, bivalves and sediments throughout coastal waters of the U.S.

There is some good news, however. Based on NOAA analyses of historical monitoring data from 13 other national programs, decreasing concentrations of DDT within fish and shellfish are evident nationwide. Decreasing concentrations of PCBs, dieldrin and toxaphene are also evident.

More recently, we have analyzed the last three years of the NOAA Mussel Watch data to look for trends in concentrations of pollutants in mussels and oysters at about 150 sites. Our objective is to find those sites where pollutant levels are decreasing or increasing significantly due to human activities, and to indicate places where control strategies are effective or not.

Since the data are only for three years, and are spatially limited to only 150 sites, our analyses must be viewed as very preliminary and must be interpreted with caution.

However, they are among the first systematic signals of trends in national coastal environmental quality, and will be more reliable as indicators as additional years of data are added.

What do these elevated levels of toxic pollutants mean in terms of the health of coastal ecosystems? NOAA research has already documented the relationships between liver tumors in fish and the presence of elevated levels of aromatic hydrocarbons. We have identified areas of Puget Sound, San Francisco Bay, and the Southern California Bight where fish are incapable of normal rates of reproduction.

However, because of the complexity of the coastal ocean and the multitude of toxic chemicals in it, absolute proof of causal relationships between specific toxic chemicals and the loss of reproductive capabilities in fish and shellfish may not be possible. Even though our results are promising, we are only beginning to scratch the surface of this problem through our limited research.

I think I will end there, Senator. My written testimony summarizes many other areas.

Senator **Lautenberg**. At this point, because I have to leave the chair, I would ask Senator Chafee if he would lead off with his questions.

What we will do is that we will put a five-minute time on each of the Senators and will go a second round, if necessary.

So, Senator Chafee, if you would start, please?

Senator **Chafee**. Thank you, Mr. Chairman.

Mr. Levenson, first of all, I thought your testimony was very, very good, but disturbing, however. The fact that such a large percentage of our population is going to live close to the coast.

Was it you who said that by the year 2000, three-quarters of the United States population is going to live within 50 miles of the coast or the Great Lakes? It shows the strain that is imposed on these bodies of water.

Do you think that the legislation that we are considering here today—either S. 1178 or S. 1179—will take care of the problems that you raise?

Mr. **Levenson**. I think it will partially take care of the problems.

There are really three basic things that are needed. One is to strengthen the Clean Water Act provisions, and I think this legislation certainly does that very well.

Another is to establish an overall system for selecting water bodies and getting management conferences going, and again the legislation addresses that.

It does not address in great detail the problems associated with coastal development.

Senator **Chafee**. That is a problem that may well be beyond the reach of this Congress, if any Congress.

Mr. **Levenson**. I understand that.

Senator **Chafee**. The mere word "land planning" is always like waving a red flag in front of a bull. The feeling is that that is an area that the Congress of the United States should not be involved in. That is a local matter.

The problem is that so many of these estuaries are multi-State estuaries. We are finding that in our Narragansett Bay study, where Massachusetts is a major contributor to the pollution, and whatever Rhode Island does can be just overcome by what Massachusetts does.

Do you think there is enough data in existence to determine which water bodies are degraded?

Mr. **Levenson**. I think there probably is, at least for a first approximation, and I am sure that much of the data which Mr. Ehler has mentioned would be useful in that.

Senator **Chafee**. Mr. Ehler, do you think that the proposed legislation allows us to adequately manage the land adjacent to the bays and estuaries?

Mr. **Ehler**. No, sir, I do not think it does.

I agree with Mr. Levenson in terms of the specifics of the proposed legislation. However, it will not be effective in managing what is the crux of the problem, and that is accelerating coastal development.

I simply do not see the enforceable provisions of the various proposals that would be adequate to effectively guide development in ways that would either improve or maintain environmental quality in coastal areas.

Senator **Chafee**. Both of you, and particularly Mr. Levenson, talked about waste reduction. Could you amplify on that a little bit? I am not quite sure what you mean.

For instance, the toxic materials, or the heavy metals are in the sewage that comes out?

Mr. **Levenson**. There has been a growing consensus in the last few years that if we could avoid generating wastes in the first place, obviously, we would avoid a lot of the pollution.

Senator **Chafee**. I can see that with solid waste. How do you do it with liquid wastes?

Mr. **Levenson**. Well, the same thing can apply to industrial processes at the plant. There are ways to—and there is a lot of information available on this—recycle different liquid streams within the plant, different substitutes that might be available for certain substances.

EPA has started an effort on that, and there has been a lot of attention to it. It is in its infancy.

Senator **Chafee**. I had the privilege of seeing in our State some tremendous efforts that were taken in waste reduction as far as solid waste goes. We are achieving something in the neighborhood of 20 percent reduction right now.

More can be done, presumably. But I had not really concentrated on or given much attention to the liquid waste reduction.

Mr. **Levenson**. Well, of course, most of the attention has gone to hazardous solid waste. But there is still a lot of attention at the industrial level to the liquid waste streams, and there are companies who have attacked that problem, although not in relation to marine discharges.

Senator **Chafee**. Yes.

Senator Graham.

Senator **Graham**. Thank you, Senator.

I would like to return to the question of land use policy.

There are some important Federal levels relative to land use, and I would be interested in your assessment of how they have been utilized, or how they might be utilized to contribute towards the reduction of marine pollution.

One of those is the flood insurance program, which was intended to carry with it some land use standards for those coastal areas which participated.

How effective has that program been in terms of dealing with land use occasioned marine pollutants?

Mr. **Ehler**. Well, I am certainly no expert in land use legislation, or land use controls per se, and I honestly do not know much about flood insurance legislation or regulations.

But there is another very important piece of legislation, the Federal Coastal Zone Management Act, which certainly is an opportunity to develop management plans that are balanced—as I mentioned in my testimony—between development and environmental protection, but which really have not been used effectively, either at the Federal level, between ourselves and the Environmental Protection Agency, or within States, to address many of the coastal water quality problems.

Efforts are underway now between some state coastal zone management programs and the National Estuary Program of EPA to try and bring these two programs together more closely.

Again, the important dimension that Coastal Zone Management brings to the solution of the problem is a focus on the balance between development and conservation in coastal areas. It is certainly an opportunity that has not been used effectively for coastal water quality management.

Mr. LEVENSON. I would second Mr. Ehler's comments.

OTA has not looked in detail at the flood insurance provision, although logically it seems like it would be a useful provision. We would be happy to look at that in the future.

Senator GRAHAM. Another area of Federal activity that affects land use are the various activities of the Corps of Engineers. Do you have any comments as to what their contribution has been, either to the solution or the problem?

Mr. LEVENSON. Well, certainly dredged material is by volume the largest waste material that is going into our marine waters.

There has been movement on the part of the Corps and EPA, to develop provisions such as sediment quality standards, which is also addressed in this legislation. This would give us a yardstick finally for judging what really is contaminated and what is not.

At the same time, the management conferences envisioned under, say, the National Estuary Program should have the Corps involved as an active member, so that we can look for alternative ways of disposing dredged material.

Senator GRAHAM. I was thinking more specifically about how the Corps might use its influence in land use policy.

I know that they, for instance, require access to beaches as a precondition for its participation in a coastal renourishment program. With that example, assumedly they could also make other requirements that would relate to the reduction of marine pollutant activities.

Mr. LEVENSON. I think you are correct.

The Corps could take probably a more active role in that, with encouragement from the committee.

Senator GRAHAM. Mr. Chairman, I would like to request—and I understand we are going to have another hearing on this set of bills later this month—that we might have some panel or other opportunity to focus on the specific issue of existing and potentially reformed Federal legislation that would deal with the land use related issue.

I think that unless we have some means of focusing on that aspect of the question, our other efforts at marine enhancement are likely to be substantially dissipated.

Senator LAUTENBERG. Thank you very much, Senator Graham.

Certainly we will take a look at that. If you use it excessively, the likelihood follows that you are going to abuse it, and it has got to be very carefully articulated.

We in the State of New Jersey, within the State Legislature and the Governor's Office are wrestling over plans to try to regulate coastal use: coastal zone management, to see whether or not the development that is taking place can continue without totally destroying the marine and the coastal environment.

We thank you very much for your comments, and we will try to get together before the next hearing.

Senator **Graham**. One last question.

We had several instances recently of oil spills and other large-scale marine contamination.

Do you have any comments as to the adequacy of the protective measures and the response capabilities to the kind of incidents that we have just seen in the Northeast as well as in Alaska?

Mr. **Ehler**. Well, I have been intimately involved in all of those spills as the manager of both NOAA's spill response activities and our damage assessment efforts currently underway in Alaska.

I think it is well known that that particular spill in Alaska, because of its size and its location, simply overwhelmed response capabilities of all parties—the private sector as well as Federal and State agencies that were involved.

I think that there is obviously a need to improve those capabilities. The bottom line, however, is that you get what you pay for. Within NOAA, we spend about $1.5 million each year on spill response capabilities. That allows us to respond effectively to only few spills of medium size at any one time.

If we had only to deal with the East Coast spills and the Galveston spill, we would have been okay. But those on top of the Exxon Valdez spill simply overwhelmed us, and I think it overwhelmed other response capabilities as well.

Senator **Graham**. I know my time is up, but I would be interested if maybe you could supplement your comments on that last statement as to what in light of this the Administration is going to recommend in terms of resources for spill response capabilities for the next fiscal year.

Mr. **Ehler**. There is certainly a great deal of discussion about that right now.

Senator **Lautenberg**. As you have probably seen, Senator Graham, today's news story about the Administration's backtracking on its Clean Air initiative, it is not very encouraging in terms of getting help from the Administration in addressing the environmental chores before us.

After what we thought was an inadequate Clean Air proposal, I was very disappointed to see even that modified.

Mr. Levenson, the National Toxics Inventory recently released by EPA showed that over 9.5 billion pounds of toxics were released into the Nation's waters, and close to another 2 billion pounds were discharged into our Nation's sewage system.

Is it fair to say we're seeing the impact of these discharges in our coastal waters? Is that not so?

Mr. **Levenson**. Yes, it is.

Senator **Lautenberg**. The levels of these discharges suggest that we have got to attack this problem in another way, certainly, and I would look for any comments that you have.

I certainly would suggest that we have to expand our source reduction program.

Mr. **Ehler**. I would certainly agree with that, but I think that we also have to look at expanding toxic monitoring programs and developing criteria for toxic materials and sediments, as much as the proposed legislation does address. We could go beyond that and think about setting new standards for toxic materials in animals as endpoints and not just stop at the sediment quality problem.

I think that eventually we have to move beyond that to look at the quality of the animals that live in those environments.

Senator LAUTENBERG. We also have to look to the reduction of the source material, and try to use our creativity to find ways of not having to deal with the prevention issue constantly.

So this is a focus that we have tried to develop in this committee.

How do you think EPA ought to be using the information that you develop in its coastal pollution program? Do they use the information that you gather?

The Right to Know law helps us to find out a lot about what is being discharged into the air and the water, and that law, which I had the privilege of sponsoring in the Senate, has created a whole new opportunity for evaluation of what we are doing.

How do you think EPA can take the information that is being gathered and use it in its coastal pollution program?

Mr. LEVENSON. Well, I think that kind of information is critical, along with the kinds of information that NOAA is collecting, for an individual water body, when you have a management conference or some kind of planning committee, to be able to pinpoint just where the problems are coming from.

It still has to be compared to sources of toxics from, say, nonpoint pollution and so on, but it clearly gives you a level for where to focus pre-treatment programs, where waste or source reduction programs might be best focused, which industries really need help.

And EPA is beginning to establish an Office of Pollution Prevention that, in the long run, should be able to provide technical assistance to those industries that are identified a being major dischargers, using the kinds of lists or inventories that you have established.

Senator LAUTENBERG. Mr. Ehler, is NOAA doing an analysis of this information on the National Toxic Inventory?

Mr. EHLER. We are constantly looking for new sources of information to place into NOAA's National Coastal Pollutant Discharge Inventory, which we have been developing over an eight-year period.

We have sorted through various EPA databases. We are currently looking at the National Toxics Inventory to take advantage of it, but we also have included a great many State sets of data in a system that allows us to have a comprehensive inventory of point, nonpoint, and upstream sources of pollution entering coastal areas.

This is the very kind of information that is needed to set priorities across areas of the country for additional management actions.

Senator LAUTENBERG. The level of toxics being discharged in the sewage treatment facilities certainly suggests that we have to be concerned about the adequacy of pretreatment programs.

I am sure you would agree with that. And what we can do about it, as we chip away at funding for sewage treatment plants, is kind of a paradox. But one thing, I think, is certain: that we cannot solve the problem by either inhibiting or diminishing the efforts and the resources that go into developing sewage treatment facilities.

Senator Chafee was very instrumental in negotiating the reenactment of the Clean Water Act, and finally arriving at a method of funding that would at least provide the same flow of funds for a period of time. We have not been able to get the support or even the funding levels that were negotiated at that time.

So that is a serious problem, and certainly a major factor in the contribution of the degradation of our waters and our marine system.

Senator Lieberman has indicated that he would like to make a statement.

Do you want to do that? Do you have any questions of the witnesses?

OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Senator **Lieberman**. I do, Mr. Chairman. Thank you very much.

I apologize for being late, and having to leave early, because I am on an impeachment trial committee that is going on now. But I did want to stop by.

I would ask that my opening statement be included in the record.

Senator **Lautenberg**. Without objection.

[Senator Lieberman's statement follows:]

Opening Statement of Hon. Joseph I. Lieberman, U.S. Senator From the State of Connecticut

Thank you, Mr. Chairman. I appreciate the opportunity to be here today at these hearings on the protection of marine and near-coastal waters.

In my home state of Connecticut, our greatest natural resource, Long Island Sound, is also one of our greatest environmental tragedies.

Long Island Sound is the recipient of over 1 billion gallons of partially treated sewage every day. According to an article in the Hartford Courant and drawing on information supplied by the Oceanic Society, that waste water would "fill a line of tanker trucks from Hartford to Hannibal, Missouri,"—1,157 miles long.

In addition, the sound suffers the runoff debris of urban life. Sometimes it takes as little as a quarter of an inch of rain to cause our combined sewers to overflow and bypass the wastewater treatment plants altogether.

The resulting concentrations of nitrogen and phosphorus have created a condition known as Hypoxie or low dissolved oxygen in Long Island Sound—the nitrogen, in particular, working on algae the way fertilizer works on a lawn, creating huge algae blooms which eat up all the oxygen in sight, and then, when they die, eat up even more as they sink. The upshot is: anything that can't swim away fast enough, suffocates and dies. Because of this condition, whole areas of the sound are referred to as "Dead Zones."

That's why I feel the legislation we are here to discuss today is so important. It recognizes that clean water is as important to marine life and human health as is clean air. Estuaries such as Long Island Sound are miraculous systems, really, fresh water and salt in a complicated dance of life. This legislation outlines our responsibility to preserve and conserve such precious resources, and it acknowledges that if we can't recreate the dance, we can at least learn a few of the steps.

When a sewage slick floated up the East River from New York and settled in Stamford, Connecticut last summer, forcing a 34 day beach-closure, we understood—graphically—how the preservation of our marine and near coastal waters is a regional concern. I welcome Senator Mitchell's legislation to establish Regional Marine Research Stations to better understand the ways in which our marine waters interconnect.

And I appiaud Senator Lautenberg's recognition that for our efforts to succeed we must stop thinking of coastal pollution as a one-agency problem. His legislation promises improved coordination of federal agencies on coastal and marine protection.

I particularly welcome the expansion of the National Estuaries Program which has been so helpful to Long Island Sound. Several months ago I was told by a representative of the Citizens Advisory Panel of the Long Island Sound Study that one of their biggest problems in the past had been convincing the public that there was anything left alive in the sound to save. The Long Island Sound, while outlining the critical problems of sewage treatment and river management and toxic sediments, has also given new awareness and new hope to the citizenry of Connecticut and of Long Island, New York. In Connecticut, the Department of Environmental Protection has already acted to increase their monitoring at wastewater treatment plants and to step-up their enforcement against municipalities along the coast. In cooperation with New York State they've established a policy to require any expansion of treatment plants include nitrogen removal facilities; they've established an aquatic toxicity program for waters in the immediate vicinity of municipal and industrial dischargers to the sound, and the state has committed millions of new dollars to toxic sediments and harbor management implementation plans. The legislation before us today would create that kind of process for all our marine and near coastal waters.

Living things respond to care. No matter how damaged our marine and near-coastal waters, we can begin to restore them. It won't be easy and it won't be cheap. On the other hand, this is not a battle we can afford to lose.

One final note: I am pleased to see Mr. Ehler here to testify on behalf of NOAA since it indicates a willingness on the part of NOAA to remain involved in estuarine protection. But I have some very real concerns about NOAA's present involvement in the Long Island Sound Study, specifically that it is at least 7 months behind in its circulation modelling responsibilities, and that it rejected in its budget the funds needed in order to complete the model. Because of my responsibilities on the Impeachment Trial Committee, I cannot remain today to ask the questions I have for Mr. Ehler, but I will leave them with you, Mr. Chairman, and ask that they be delivered to him for prompt response, and entered into the record.

Senator LIEBERMAN. Thank you.

We are very interested in Connecticut and Long Island Sound.

Last summer when a sewage slick floated up from the East River in New York to Stamford and settled there, forcing the beaches to close for 34 days, I think we understood graphically how the preservation of our marine and near coastal waters really is a regional concern. And that is part of why I welcome Senator Mitchell's legislation on regional marine research stations and the hope that they give to better understand ways in which our marine waters interconnect.

Mr. Chairman, I also applaud your recognition that for our efforts to succeed, we have got to stop thinking of coastal pollution as a one-agency problem. Your legislation, I think, promised improved coordination of Federal agencies and coastal and marine questions that really are the way to better protection.

I have been following the Long Island Sound study very carefully. It is of real concern to us in Connecticut. I am delighted that you are here, Mr. Ehler.

I just want to express to you while I am here my own concerns, and I think they express those of many of us in Connecticut, about NOAA's involvement in the Long Island Sound studies, specifically the fact that apparently you are seven months behind in the so-called circulation modeling responsibilities, which are really critical to our understanding of where the pollution in the Sound is coming from, and therefore how can we get at it.

I was troubled to learn that NOAA did not make a request in its budget for this year for continued funding of that circulation model.

So, bottom line, my question is, what is the current status? These are questions, I guess. What is the current status of the model? Are you prepared to honor NOAA's commitment to timely completion of it? Why did you not ask for money for the next stage of the study?

Mr. EHLER. Well, I can assure you that NOAA is committed to completing the work that it has promised to do in Long Island Sound. I do not think we are quite as far behind as you may suggest in terms of that work. There were some problems with the quality of new data collected in Long Island Sound that put us behind schedule. Some of this is simply the vagaries of field collection of data—it is not always the straightforward task that is easily accomplishable on a plan that you lay out, a year or a year and a half ahead.

Senator LIEBERMAN. Do you have enough people on it now to complete it in a timely fashion?

Mr. EHLER. The problem was not one of having enough people on it. It was simply a problem of the methods that were used in the field data collection and the resultant poor quality of the data.

It is a large program. It is not just a NOAA program. Even the field collection aspects of it involve the University of Connecticut, the State University of New York at Stony Brook, and the Interstate Sanitation Commissions.

Putting all those together, sorting out the different methods that are used to collect those data, and making sure that they are all high quality has proven to be a problem. Many of these were unforeseen.

Again, I would assure you that we are committed to completing that project and catching up as soon as we can. We are in fact putting additional resources on it this year.

Senator LIEBERMAN. Good.

Mr. EHLER. That will get us back close to schedule.

Senator LIEBERMAN. What is your sense of a completion data at this point?

Mr. EHLER. Well, you are talking again about a very large program, one aspect of which is the completion of a complex circulation model that will feed into a water quality model, to eventually look at issues like eutrophication in Long Island Sound.

We will certainly be finished with a field collection this year. We will have the model up and running by early Spring of next year.

Senator LIEBERMAN. Why did you not request funding in the budget for the next fiscal year for the next phase of this study?

Mr. EHLER. The project is characterized, I think, by our budget officer as a "regional project"—one that should be funded by the regional and local beneficiaries of the work.

I think that that was the simple explanation—it did not survive the review process by NOAA management as being of national scope and concern.

Senator LIEBERMAN. Needless to say, we think that it is of national scope. We intend to pursue congressional funding of the next stage of this study.

Mr. EHLER. I understand that.

Senator LAUTENBERG. Thank you very much, Senator Lieberman.

Now, I would like to call the next panel, Ms. Jessica Landman, Ms. Carolyn Karp, and Ms. Linda Eichmiller, to the table.

You have all heard the admonition from the Chair, and that is to try to keep your remarks within the five-minute time period.

Your full statements will be placed in the record, and we invite first Ms. Landman. If you would just tell us what you do and the organization you are associated with, we invite you to give your testimony.

STATEMENT OF JESSICA LANDMAN, SENIOR ATTORNEY, NATURAL RESOURCES DEFENSE COUNCIL

Ms. LANDMAN. Thank you, Mr. Chairman.

My name is Jessica Landman, and I am an attorney with the Natural Resources Defense Council, an environmental organization with over 100,000 members around the country.

Thank you for inviting us to testify before your committee today about the legislative proposals to combat coastal pollution.

Coastal pollution has been front-page news for the past year, due to beach closings, medical waste washups, shellfish bans, oil spills and the ocean dumping of sewage sludge.

But the coastal crisis has been many years in the making. Generations of industry and sewage treatment plant discharges, along with contaminated urban and agricultural runoff have taken their toll, and the OTA 1987 study found that degradation of our coastal environment will continue and worsen, even in areas where we have seen improvements in the past, unless we do more about these diverse sources of pollution.

We need a comprehensive and far reaching plan for coastal pollution control. We welcome the introduction of S. 1178 and S. 1179, because they contain many provisions that will help to reverse the decline of our coastal waters.

We also see some areas in which the legislation might be strengthened, particularly with regard to controlling poison runoff or nonpoint source pollution, and I will summarize some of NRDC's views about the major provisions of the legislation.

First, we support placing increased controls on discharges into coastal waters, and particularly the requirement that dischargers implement waste minimization and waste reduction efforts before receiving their discharge permits.

This approach furthers our National goal of waste reduction, which you referred to earlier, and it also builds on the Clean Water Act's technology forcing mandate, that we move closer and closer over time to ending discharges through increasingly tightened best available technology controls on direct dischargers.

But we urge that the reach of this provision in the draft legislation be expanded to apply to all coastal waters, and not just to discharges in areas that have been designated as degraded. We think that it is better from both an ecological and a cost effectiveness standpoint to prevent water quality degradation in the first place, rather than to repair damage once it has already been done.

And we also think that that would be more consistent with the Clean Water Act's anti-degradation policy, which requires that clean waters be kept clean in the first place.

We would also support imposition, as proposed in the legislation, of storm water permitting requirements for discharges to degraded coastal waters. This proposed provision would help to reinforce the requirements of the existing law, which we have found EPA to be very slow in implementing since the enactment of the 1987 amendments.

Marine combined sewer overflows are a major cause of beach fouling problems and shellfish contamination problems in the near coastal areas, and we strongly support the proposals that call for the States to identify combined sewer overflows and for the municipalities to develop and implement programs that would eliminate those overflows.

However, we think that a five year identification and control schedule would be appropriate for the legislation.

We recognize that ending the CSO problem is going to cost in the tens of billions of dollars, but inaction on this issue also carries a very high price tag, first of all, in the area of lost tourism and fishing dollars, and secondly in the area of incalculable harm to coastal ecosystems.

It is clear that we need a major National commitment of finances as well as a political effort to eliminate raw sewage discharges and other wastes from CSOs.

There is one more point source of coastal contamination that we feel should be addressed. We believe that Congress should reconsider the Clean Water Act's 301(h) waiver provision, which allows sewage treatment plants to give only rudimentary treatment to sewage waste before discharging it to the ocean.

The secondary treatment waiver was based on the notion that the ocean could safely assimilate sewage wastes without long term harm to the environment. But that notion has been proven incorrect.

The sheer quantity of wastes that are entering our coastal waters makes the notion of assimilation out of date. More important, sewage wastes from sewage treatment plants contain toxic contaminants from industry and from other sources.

Even if pretreatment programs were fully implemented—and history has shown that they often are not fully and properly implemented—pretreatment standards do not protect adequately against toxics when the secondary treatment phase is skipped at the sewage treatment plant.

We therefore urge that the 301(h) waiver be phased out, or at the very least that additional steps be taken to remove toxics from ocean discharges at sewage treatment plants holding 301(h) waivers.

Poison runoff, or nonpoint source pollution, is the single remaining largest source of water pollution in the country. The 1987 amendments gave the States and EPA a mandate to control poison runoff, but the response so far has been a very weak one.

Only one State in five has adequately assessed the problem, and less than one State in 10 has developed an adequate control plan, according to EPA's evaluations.

Stronger Federal leadership clearly is needed. We support the provisions in these bills to require EPA to step in and implement poison runoff control programs in States that fail to act, and we strongly support the provision in your bill which links the conservation reserve program directly to water quality protection goals.

But we feel that those provisions do not go far enough. Tomorrow, NRDC is going to release a major study which is entitled

"Poison Runoff: A Guide to State and Local Control of Nonpoint Source Water Pollution." Our study shows that the States really must link water quality controls directly to land use activities in the coastal zone, in order to make headway in controlling poison runoff.

State water quality agencies, we believe, should have to certify to State or local agencies that issue permits for major developments and activities in coastal areas that could affect water quality, and those certifications would have to show that the development would not violate water quality standards.

We believe this that approach should be used to require consideration of cumulative impacts of development and spur, thereby, water quality officials at the State level to work with other State and local agencies to plan for water quality protection.

This approach is based on the model of the 401 certification program in the Clean Water Act, and we believe that the proposal in S. 1178 to tie the 401 certification program to Federal flood insurance is a good step in that direction.

This proposal that we make today goes further in the same direction.

Thank you very much.

Senator **Lautenberg**. Thank you very much, Ms. Landman.

Now we would ask that Ms. Karp—I am sorry that Senator Chafee is not here. I know that he would welcome you in particular.

We, of course, all do. Narragansett Bay and the coast of Rhode Island is a very important part of the whole coastal configuration, and we are pleased to have you here with us, and invite you to give your testimony.

STATEMENT OF CAROLYN KARP, PROJECT DIRECTOR, NARRAGANSETT BAY ESTUARIES PROGRAM

Ms. **Karp**. Thank you very much, Mr. Chairman.

As you mentioned, I am the director of the Narragansett Bay Project, and I was asked to give a brief overview of water quality in Narragansett Bay before I remarked on the bills under consideration.

I am going to start with the *World Prodigy,* which is the ship that ran aground on Breton Reef on June 23. I think that oil spill dramatizes a major water quality problem for Narragansett Bay.

If you will recall, approximately 425,000 gallons of Number 2 heating oil were spilled on June 23. That is approximately 1,000 metric tons.

Given normal weathering practices and evaporation, about 50 percent of that oil is expected to remain in the system for some period of time—that is 500 metric tons.

We have estimates through the Narragansett Bay project that approximately 1750 metric tons of petroleum hydrocarbons are entering Narragansett Bay each year from wastewater treatment plants, combined sewers, from atmospheric deposition, and from urban and highway runoff.

That means that the oil spill itself really only reflects about a third of the annual chronic input of petroleum hydrocarbons alone.

Our figures suggest that oil spills only represent about two percent of all the oil entering Narragansett Bay.

The point of that is, we have chronic, major chronic inputs of pollutants. The same is also true of metals.

We share—people have mentioned this morning the importance of coastal land use legislation. I would say that one of our major tributaries is the Black Storm River, which we share with Massachusetts. In fact, 60 percent of that watershed is in Massachusetts, including the city of Worcester, Massachusetts.

It is the watershed, as well as the coastline, that is of concern to Narragansett Bay.

I would like to—as people probably know, the Narragansett Bay project is charged under the Clean Water Act with producing a management plan for Narragansett Bay. As part of that process, we expect to look at point source controls and nonpoint source controls. We feel obliged to look at land management practices. I think that it is unavoidable for any of the Bay's programs.

I would say that implementation will not be easy. In the case of Rhode Island, the estimated cost for simply maintaining the present level of treatment at our secondary treatment plants is between $800 million and $1.5 billion.

The State of Rhode Island presently has or expects to have within the next five years $200 million—that represents a $600 million shortfall. That is simply to maintain the present level of treatment.

I would say with regard to what Narragansett Bay will need, we will need Federal guidance, policy guidance, and we need regulations, and that brings me to my comments on the bills.

I have submitted more detailed comments for your consideration.

I think the Senate package is extremely important in terms of its toxics reduction and waste minimization components. I would say that in addition, and most importantly of all, the nonpoint source control measures are absolutely critical. I would agree with the former witnesses that it needs to be expanded to look at more broad issues of land use control.

The marine ESOs are of course important. There are 96 ESOs in the State of Rhode Island.

I would say that an extremely important element of the Senate package is the review of Federal or consistency of Federal activities with water quality protection. In addition, I think that there are some new enforcement options presented in these bills which would be extremely helpful. I would include in that the possibility of conditioning Federal grants on compliance with water quality regulations.

I would include with that perhaps expanding citizens' surjurisdiction, perhaps even to the coastal zone management agencies.

The research and monitoring provisions are extremely important. I would support all of them in one form or another, and particularly the new studies.

I think that it has become clear within the past year that we have neglected perhaps atmospheric deposition. Your bill will address that. I would applaud all those measures.

In addition, several of these bills referred to the National Estuary Program in various ways, and I think that it is worth stating very quickly that the bay's programs really are an experiment in comprehensive planning.

They have not really been tested yet. What I think that means is that the Senate should look very carefully at those programs and what they are best suited for.

For example, we are better at comprehensive planning than at facilities scale planning. We are better at local or site-specific planning than at regional planning, I would think.

These bays programs are designed to achieve consensus. Implementation is seen to be a process that will involve almost all the relevant Governmental agencies. What that means is that we are not designed to be regulators, and conferring regulatory authority on the Bay's programs is probably not appropriate.

In summary, I would like to congratulate the Senate for these bills, in particular for the focus on waste reduction, toxics reduction, and on nonpoint source controls, which I do not believe go far enough.

There is some new focus on land use and some water quality, and I would applaud that as well.

Thank you very much.

Senator **Lautenberg**. Thank you very much, Ms. Karp.

Now we would like to call on Ms. Eichmiller, who is the Deputy Director of the Association of State and Interstate Water Pollution Control Administrators.

STATEMENT OF LINDA EICHMILLER, DEPUTY DIRECTOR, ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Ms. **Eichmiller**. We are pleased to be here and applaud you very sincerely about focusing attention on marine resources. That is very important to the future of environmental protection in this country.

I would like to spend my time focusing on the legislation and areas of encouragement the States would offer, and further development of that legislation.

First and foremost, as you know, there has been a great deal of work that has been done under the Clean Water Act, and we would encourage you in the legislation to recognize the value of the very extensive efforts going on in your States as well as others, and build on those activities, using as much as possible the existing framework of institutions. The major advantage of such an approach is to avoid delay and to expedite activities.

We do believe as States that the Clean Water Act is the most appropriate mechanism for dealing with these problems because of all of the source authorities in the Act. Many of the activities that you have highlighted in your bills give much impetus to addressing these problems and we believe they are in fact activities that are priority now, or if they are not, they should be.

This is to say that in many areas we do not need further legislation, and we would encourage you to sort out the areas where legislation is needed as opposed to the areas where oversight is needed and more administrative attention is in order.

In the latter, where administrative attention is needed, we encourage the committee to avoid delay of legislation enactment, and focus on why these activities are not working as well as we would like them to work.

From our perspective, as State water quality agencies, we feel that the major problem that is confronting us, and inhibiting our control of marine environments, is just simply a lack of financial resources.

Under the section 106 program at the State level and with the termination of construction grants, there is a precipitous decline in Federal support to State management of the water program. That is affecting oceans as it is all other water in the United States, and if we cannot infuse a great increase of resources to State management, you are going to see the effect in the deterioration of ocean protection programs.

Secondly, as we have heard today, CSOs, combined sewers and nonpoint sources are just terribly important in the area of marine protection, and therefore full funding of the State revolving loan fund and section 319 is very much needed. I do not need to tell you that, but it is a major stumbling block for the States in delivering the kind of protection that you would like to see.

We would also encourage you, in your marine bills, to recognize that marine protection can be provided best by building strong, basic water programs; that our concern for oceans should not divert attention from, but increase the basic enforcement and permitting and standard setting programs. That aspect of the environmental program should receive more attention.

What we do not want to see come out of these bills, as States, is a separate marine program, a separate oceans program, separate reporting requirements, and added on controls for certain parts of the country and not for others. It gets very confusing—whereas we need strong permitting programs and strong standards programs across the board. In the administration of those programs, you have every right, and the Nation has every right, to demand that the oceans receive the attention they deserve.

In providing that attention, as was alluded to by several people before, and the panelists here with me—we recognize as States that much of the waste that goes into the coastal area comes from remote places far upstream. We cannot, as States, focus on reporting requirements and encourage you not to focus on reporting and control requirements for shoreline source areas, but do so in a comprehensive fashion. This problem can only be solved with programs that deal with the coastal problem and what comes from the watersheds upstream.

If we limit our attention to the coast, we are going to miss much of the pollutant loadings that have been talked about. In the Narragansett Bay, that is 60 percent of their problem, and that is not unusual.

Lastly, we have a concern in the two major bills about the EPA's authority to set water quality standards. We would like to see the States' authority retained in that area for several reasons. First, we do not believe that EPA has the information or the resources to establish those kinds of standards throughout the country.

Secondly, many States have laws that prohibit them from being more stringent than the Federal standards. So what you are in essence doing is saddling us with a minimum requirement, whereas many States would like to have the flexibility to go above that as appropriate.

At the same time, we think that your attention on criteria, the need for sediment and other criteria, is terribly important. States cannot do the job in establishing standards without the research at the Federal level and the EPA criteria, in guidance, to use in developing appropriate State estuarine standards.

That lastly (i.e., criteria development), without question, is going to be a very difficult task, but it is—with nonpoint sources and marine habitats—the major focus, or should be, of utmost priority in the Agency.

Thank you.

Senator LAUTENBERG. Thank you very much, Ms. Eichmiller.

The things that struck me about Ms. Eichmiller's comments were the relatively—if I may call them so—narrow scope of what you think is the way to deal with the problems, when we have heard so much about comprehensive programs.

We talk about upstream developments. Obviously if we at least pinpoint the areas, it forces our view to the sources for these problems, and at least whether we back into it, or we start at the very earliest point, it almost does not matter.

It is my believe, however, that as our bill states, if we look for those areas that are terribly degraded, those that need attention, at least it forces us to focus on why it is happening and how we get there. But for each one of you, we thank you for the enlightening testimony that you did present.

One thing is for certain—we have enormous problems on our hands, and we want to get on with solving them. I paid my second visit to Prince William Sound in the last three months. I was there three days after the spill took place, because in addition to the responsibility as Chairman of this subcommittee and member of the Environment and Public Works committee, I am chairman of the funding subcommittee that deals with Coast Guard, and I wanted to see how that agency related to their responsibilities there.

We have now up in Prince William Sound almost a full military engagement there. They have 10,000 people working on cleaning up this pollution, and down to paper towels and hands and knees.

I walked some of the cobble beaches there and could barely maintain my footing because of the slipperiness of the rocks and the shoreline. That material has penetrated, in some cases, to three and a half feet into the earth. That is never going to come out.

Whether it just is ugly, or toxic, is going to take some time to discover. But it surely does not help, and when you see the result of this, the decline of species like the eagle as a result of this single spill, and how hard we work to preserve every little egg and every opportunity to expand that very important part of our system—the birds and the sea mammals, etc.—it is pathetic.

It is tragic to witness what can happen in a single event, and of course Narragansett Bay just had its problem.

EPA has proposed to limit the storm water discharge program, to incorporated municipalities. That means that they are not going to be controlling discharges from certain coastal counties. Does that make sense?

Those counties are one of the problems we ought to be focusing on if we are going to end coastal degradation, and we have not defined this, somehow.

Yes?

Ms. Landman. We do not think that it makes sense. We think that it is a difference without a distinction that EPA has tried to draw between coastal counties and incorporated municipalities. It does not really even have a grounding in the Clean Water Act, besides running counter to common sense.

If the effort is intended to be geared towards controlling storm water pollution, it should not make any difference. It does not matter under the Clean Water Act, and it should not in the regulations, whether that storm water originates in an incorporated municipality or in a densely populated county.

Senator Lautenberg. Under the Clean Water Act, originally passed in 1972, point sources of pollutants are to be permitted and controlled.

Do you want to give your opinion why we have not yet issued permits for all combined sewer overflow discharges, let alone controlled such discharges?

Ms. Karp.

Ms. Karp. I am certainly not speaking for EPA in this matter, but there has always been some confusion in terminology about whether combined sewers really are point sources, or whether they ought to be treated as nonpoint sources.

In my view, it has been a distinction without any real merit. I believe, for a delegated State such as Rhode Island, it is seen to be just an immense effort, and Rhode Island has not unilaterally gone ahead and permitted its 96 CSOs.

But what it has done is really started programs to try to control at least these segments, and I suspect that EPA may in part be waiting for some of these major metropolitan areas to solve their problems. They expect them to be eliminated within the next few years.

Senator Lautenberg. How should the CSOs be regulated? What do you think?

Ms. Karp. I personally believe they ought to be eliminated. The City of Providence, for example, has the treatment capacity. If the storage facilities were built along these combined sewers to just store that fluid until after the storm, I think that would help.

I think in reference to the bills, none of them stress strongly enough the need for water conservation and reexamination of water use. In the case of Rhode Island, it is estimated just for the City of Providence that possibly up to 30 percent of the flow coming into that plant is infiltration inflow.

If some of those problems are solved, we are also at least indirectly addressing the combined sewer problem. I personally do not believe we ought to go for separate sewers, just as an aside.

Senator Lautenberg. I want to confirm the fact that in a city the size of Chicago, they do have an underground storage facility being developed, but you are right.

The reason I respond as I did was when you said they ought to be eliminated—I agree. It is a major effort, and we have to get on with these things at one time or the other, and there seems to be no time like the present, because there is an awareness out there in the community that did not exist before.

People across this country are sick and tired of seeing their environment spoiled, and want to preserve it in some way.

At this point, I will ask Senator Chafee to see if he has any questions.

Senator CHAFEE. Thank you, Mr. Chairman.

First I want to say how glad I am that Ms. Karp is here. She has been working for some time on the Narragansett Bay project and has done an excellent job.

I had the privilege of meeting with her last week, when at home, and I am sorry that I missed your testimony here, but I had a prior commitment.

Let me see if I have understood what you are saying. You are saying that in—a city like Providence, an older city—30 percent of the volume that comes through their CSOs or through their sewage treatment plants——

Ms. KARP. Through their sewage treatment plant——

Senator CHAFEE [continuing]. Is infiltration. In other words, the pipes are so rotten that it is seepage of water into it. And if we had decent modern pipes that did not leak, you would reduce the volume by 30 percent.

Ms. KARP. That is at least according to one facility's estimates.

The trouble is that those pipes are not necessarily under the jurisdiction of the facility, and that is in fact the case in Providence.

Senator CHAFEE. Please go through that again. What do you mean they are not under the jurisdiction of the facility?

Ms. KARP. A State agency called the Narragansett Bay Commission operates the sewage treatment facility, but the City of Providence owns and operates most of the lateral sewers.

The infiltration problem is believed to exist mostly in segments of the city where the City of Providence controls the lines, and the sewer facility, the sewer authority, has no jurisdiction—no jurisdiction to repair or replace those pipes.

Senator CHAFEE. Yes, but that is rather a unique situation.

That came about because the situation got so out of hand that they had to come forward with another agency to take control of it, and to give them the money to repair it. So I think that would be rather unique.

Ms. KARP. I think you are right.

Senator CHAFEE. But I suppose the answer is at sometime or another, it is probably cheaper to build a larger treatment plant to handle the infiltration than it is to go back and replace all the pipes that exist.

And I also suppose it is very difficult to know where it is infiltrating.

Ms. KARP. I believe that is true in an engineering sense.

Senator CHAFEE. And furthermore, the Federal Government gives you money for the plant, but it does not give you money for many of the pipes and certainly it does not give you money for replacement pipes.

Ms. **Karp**. That is correct.

Construction grants program never considered that to be an eligible cost.

Senator **Chafee**. What advice do you have for us on the proliferation of marinas and residential development, condominiums and so forth that are springing up all along the shorelines of these estuaries that we are trying to save?

You think we have got problems? I will bet that Florida has much more problems than we have on residential development. What can we do?

Ms. **Karp**. Well, I think in the case of Rhode Island, it is clear that the waters are being increasingly degraded by the proliferation of marinas and proliferation of coastal developments.

I personally believe that pressure has to be put on the boat manufacturing industry to install treatment devices on the boats.

Somebody from my staff attended a boat show recently, and large boats—which are typical of Narragansett Bay—are being sold without any capability of storing and treating sewage on board.

I think that it has got to start at the industry side. Unless the boats are equipped to store and contain sewage, it is really impractical for the State to regulate the problem.

In addition, I think there need to be two other things.

We need to consider the use of pump-out stations that cannot be——

Senator **Chafee**. You mean at the marinas?

Ms. **Karp**. At the marinas, although given the number of boats that need a pump-out station, you would not need many in Narragansett Bay, for example. It would be approximately five at most—five regionally located pump-out facilities.

The problem is septate disposal, and I think we do not have any Federal guidance on how to treat septate. Not much research is being done into alternative technologies.

I think that would be important. It cannot be done at the local level.

We have in Rhode Island no way to dispose of septate. In fact, many of the municipal facilities turn away septate. Until that is reversed, it is very difficult to impose a pump-out facility requirement, I would say.

Ms. **Eichmiller**. Senator, I would add, from the States' perspective, in terms of dealing with these problems on a local level, we have found that when we are able to organize the information that is available on what the problems are and where the activities are taking place, and sit down with the local governments in a cooperative fashion, providing technical assistance, they are overwhelmingly grateful.

This enables them to work and solve their problems so much better than to isolate one unit of government from another. So cooperation helps a great deal in making major progress in these kinds of areas.

Senator **Chafee**. Well, I am not sure what you are saying.

You have a great, big estate that is along the shoreline, and the owner dies, and the estate is broken up into smaller parcels, and condominiums and all the other things that come when an estate is broken up—right along the shorelines.

Ocean view lot, $300,000, or whatever it is. Now, what do you do?

Ms. **Eichmiller**. I recognize what you are saying, and that is very typical.

I think what you try to do is to avoid the problem by—from the States' perspective—identifying that development is a concern, laying out the land use patterns for the local governments, and the options that they have to deal with them, to help local governments institute land use practices, codes, and regulations.

When these problems come up, they can be dealt with, rather than on a fire drill basis when each of these estates get broken up one by one, to try to help them get organized and act in a preventative fashion in dealing with this.

Senator **Chafee**. And who does that help come from, to the local communities?

Ms. **Eichmiller**. I think there is a role for the county there. I think there is a great deal of information that resides at the State level.

Then, it's a cooperative venture. I think States have a role in that, and counties have a role in that. Local governments and citizens have a role in that.

Ms. **Landman**. Senator, if I may——

Senator **Chafee**. My time is up.

If you want to be brief——

Ms. **Landman**. I will be brief.

The legal authorities probably exist to take on the kind of comprehensive land use planning in an area like that in many cases, where the State has thought out in advance what kinds of densities would be appropriate, and what kinds of critical areas controls ought to be in place.

What we have lacked—even though 319, the new provision in the 1987 amendments, called for the States to develop nonpoint source pollution management plans on a Statewide basis—that provision should have spurred many States to develop just that kind of comprehensive land use planning and management to protect water quality. But it has not resulted in very many of the States taking that kind of initiative. That is why we think the provisions in these bills that call for Federal action in the event of State inaction would help to provide a necessary spur there, and we also see a need for Federal funding for the 319 program.

Senator **Chafee**. Thank you.

Senator **Lautenberg**. Senator Graham.

Senator **Graham**. Each of you has made reference to the importance of the Federal Government funding the 319 program.

Last year, a great deal of time was spent in trying to develop the transition of that program from where it had been to where it will be in the mid-1990s.

Now we are faced with the prospect of substantially less funding then the authorization levels upon which that transition was predicated.

Could you comment as to what effect it is having on the States, in terms of their efforts to plan and provide for a financial base to accept a larger share of this responsibility that the Federal Government is not funding at the authorization level?

Ms. **Eichmiller**. Let me first speak for the States here.

I have been involved in the area of nonpoint source control for several years—probably more than I would like. And I am absolutely amazed at the progress that is being made at the State and local level, in actually dealing with nonpoint sources.

They are trying very hard. They are making progress, significantly, but it is going to take years.

I have to say that many times, they feel as if they are very alone in dealing with nonpoint sources. The lack of Federal funding, in and of itself, is very disappointing to them. What they feel that they need is a partner when they go to the legislatures to say, "this is a Nationally important problem, and we need your support."

When they go to the farmers and the local governments, it is very important to have that funding, and it is very important to have that visible Federal partner.

It is a dilemma for us, and it concerns us in the long term. Hopefully this is a short term problem that we have. But, it is a major one, not only in terms of the money, but the visibility of the Federal importance.

It is a very big disappointment. But on the other hand, States are trying to do the best that they can. They are very concerned, trying to do so even without money from the partners. People on one State boundary say, "well, my neighboring State is not doing anything, why should we?"

We need to keep a united front and try in the interim to get as much money as we can, and with policy and priorities—sort of bluster our way through.

Ms. **Karp**. If I might respond quickly from the perspective of the State of Rhode Island, we have an approved nonpoint source management plan that has been approved by EPA.

It has not been funded at the appropriate level. We do expect to incorporate many of the recommendations of that plan into the Narragansett Bay Project management plan.

In addition, the State revolving fund, which is in the process of being developed will help pay for some nonpoints, or identified nonpoint source programs.

I want to say this as sort of an important aside. Highway runoff is considered to be a major, major contributor of all the hydrocarbons, of lead and of cadmium in the Narragansett Bay area.

It seems to me without money—it takes some regulatory tinkering with the Federal Highway Act, you require basically highway runoff controls on any Federally-funded highway project.

In addition, I personally would like to see, any time the Federal funds go to a State to help repair roads, that they be conditioned in the same way, that highways be retrofitted for some of those runoff controls.

Ms. **Landman**. I think that the lack of funding from Congress for the 319 program has been part of a destructive cycle that EPA has contributed to, to a degree. They have said to the States, there is no funding in the near term for this program, and that has contributed to a perception on the part of the States that EPA does not view this program as as high a priority as it might.

Our study, Poison Runoff, also deals with the question of funding. And I think that while there is definitely a role for Federal funding to contribute in the 319 program, there is also a need for

States to begin to think in terms of developing dedicated sources of funding for the types of programs that will protect against poison runoff.

That would include looking at things like taxes on agricultural chemicals and fertilizers that contribute to the contamination problem. It might include, for example, local storm sewer use ordinance funding programs that would be sort of like the way that you pay your water bill. You would also pay a storm water control bill every month.

Senator **Graham**. Mr. Chairman, I see my time is almost up.

I would like to use the remaining time to make a personal comment. I believe that when the Federal Government engages in a partnership with States and local communities and makes representations as to what its level of participation is going to be, and then fails to live up to those representations, it is very destructive.

It is destructive in terms of the planning efforts that are made at the local level, which then cannot be realized because the Federal funds are not forthcoming. It is destructive in terms of the erosion of political support at the local level, when the Federal Government appears to recant its previous statement.

I think it is destructive in terms of the credibility of the Federal Government on that particular program, and then that destruction tends to pervade the entire Federal/State relationship.

I would suggest that as part of this effort that we ought to go back and reexamine some of the programs that are going to be critical for achieving our goal of marine quality, and almost have a domestic summit between the Congress and the Executive as to what are we going to be prepared to commit at the Federal level, and let us put those realities into the law, rather than hopes and dreams that turn out to be nightmares at the local and State level when they are not realized.

Senator **Lautenberg**. Senator Graham has the unique position of being able to talk with knowledge and experience, having been the Governor of the State of Florida, a State that has so much of its life focused around the marine environment and the coastal area, and someone who also has a profound and very deep interest in improving and preserving the environmental quality that is so precious to all of us.

I could not agree with you more that to propose at the Federal level that this Government is going to be participating with the States in improving or protecting the quality of the environment, and then to gradually step back from those commitments is perhaps even more destructive than not having made an offer at all.

It then forces the States to either form some kind of a regional structure or turn to other ways to finance these programs. But I am sure that you will find agreement among the three of us who sit here that the Federal Government has a very important responsibility.

These problems transcend State lines so obviously. They also transcend party preferences, and they also transcend the very narrow regional aspect.

We cannot solve them by dealing solely with nonpoint source in Rhode Island, let us say, or New Jersey. We have to deal with it collectively as a Nation.

Senator Graham, I appreciate your comments. And one of the things that I think all of us will have to do is to work very closely together to see that we develop legislation that has the force of reality behind it, and that is funding to make certain that once we make a commitment, we are going to stick with it, and to support the American people's interest and wishes that we get on with this task.

Nothing seems quite to have captured the focus of people across the globe as the quality of the environment. I do not know whether any of you had a chance to hear President Bush's speech in Hungary, but one of the things that got some attention there was environmental commitment.

So we appreciate your participation. Each of you contributed significantly.

Senator CHAFEE. Mr. Chairman, could I make one comment?

Senator LAUTENBERG. Please, Senator.

Senator CHAFEE. I think we are all beginning to realize that nonpoint source pollution is now becoming the primary villain in connection with the degradation of our waters. It is important to harken to a statement of Ms. Karp's about our highway program.

Our highway program not only does little regarding its runoffs, whether it is the oils and leaks from cars, but also the salts that are put on it, and there is little attention paid to the runoff from that.

Furthermore, where the highways go is always a struggle. On one hand, we are trying to save wetlands. On the other hand, the highway program goes charging through where they want to go, with little concern for the wetlands.

And somehow, we have got to recognize that the Federal highway program has to be more environmentally conscious than it has been in the past.

I met last week, as I mentioned, with Ms. Karp, and she mentioned that one of the real problems she has is that trying to persuade the highway people to be more conscious of the environment. But that is way down on their priorities list. They are concerned with saving lives and highway safety, and the quality of the highways they are going to build.

And so, I think when we take up the highway bill next year, I personally am going to harken to what Ms. Karp said, and try to put stiffer environmental controls into the highway construction program than we currently have.

Senator LAUTENBERG. Thank you.

Ms. Karp, you did know, did you, that this committee has jurisdiction over highways, when you made that remark?

Thank you very much, the three of you.

We now invite the last panel, Mr. Fox, Mr. Brouha, and Mr. Paterson, to come to the witness table.

Thank you, gentlemen, for joining us.

The rules of the game are that you have five minutes to summarize weeks of work on your testimony. The testimony will be included in the record, I promise you that.

We invite you now in the following order: Mr. Fox, Mr. Brouha, and Mr. Patterson, to give your testimony. Just tell us what you do in each case, and your organization.

Mr. Fox?

STATEMENT OF CHARLES FOX, DIRECTOR, CONGRESSIONAL AFFAIRS, FRIENDS OF THE EARTH

Mr. Fox. Thank you, Mr. Chairman.

My name is Charles Fox. I am legislative director of the newly-merged Friends of the Earth environmental policy institute in the Oceanic Society.

We are a global advocacy group with affiliates in 33 nations, and 4 chapters throughout the United States.

Joining me today is Boyce Miller, who is the staff scientist of the Oceanic Society.

I would like to open by extending our appreciation to Mr. Chafee, you, Mr. Chairman, Mr. Mitchell and Mr. Carey of Massachusetts for the introduction of the comprehensive coastal legislation, and say that we are confident that with your continued leadership, we will see some really important efforts this session of Congress.

Our written statement describes in some detail the problems of the Nation's coastal environments, as well as some of the shortcomings of existing Federal programs and policies. Suffice it to say, our Nation's coastal crisis is not limited to syringes, slicks and sludge.

Virtually all regions of the country are threatened by pollution, habitat loss, and improper coastal development.

Rather than describe our detailed conclusions and recommendations this morning, I will mention five of the overall policy goals we believe are important to be considered by this committee. These are described in our written testimony, beginning on page 8.

First and foremost—and we are delighted to see the discussion this morning focus on it—is coastal development. It is abundantly clear that new coastal legislation must address the cumulative effects of growth and development.

It is essential that the Federal Government stimulate new coastal land protection measures from State and local governments. The waves of people descending upon the Nation's coasts must be directed away from existing undeveloped and critical coastal areas.

We are not suggesting that the Federal Government become involved in all local land use decisions. Rather, the Federal role could be limited to issuance of minimum criteria for State governments.

These criteria, in turn, could narrowly focus on the strip of land which surrounds all tidal coastal waters and tributaries. The criteria would seek to protect water quality and coastal habitats by channeling growth to those areas best suited to accommodate it.

Without such bold new actions aimed at prevention, there is little question that the Nation will lose the battle to protect coastal ecosystems.

In 20 years, down east Maine may look more like highly developed Casco Bay. Undeveloped portions of Narragansett Bay or Puget Sound could experience Ocean City-ization.

Beach closings and seafood consumption restrictions could become more the rule than the exception.

Second, new coastal legislation should seek to provide citizens with new tools to stimulate their involvement in decision making. Coastal data and information should be provided in plain English and in understandable, usable terms. The new toxics release inventory program authorized by this committee may serve as a good model.

At future hearings, local grass roots, coastal citizens' organizations should be asked to provide comments and recommendations on the proposals being considered by Congress.

Third, new Federal programs and authorities should apply to all coastal regions, including the Great Lakes. It seems inappropriate to establish a tiered system of protection whereby some regions receive special attention or authority and other areas do not.

It seems inappropriate to establish a tiered system of protection whereby some regions receive special attention or authority and others do not.

Such discriminatory policies suggest that certain areas be written off, whether they be too degraded, too healthy, or simply lacking sufficient political clout.

The overwhelming scientific evidence suggests that all coastal regions are ecologically important, and that all regions need new protective measures.

Fourth, broad new protection strategies should not be mandated of State governments without substantial new authorities and new funding.

The history of such endeavors suggests that simply requiring State development of coastal protection strategies will do little to clean up coastal ecosystems. Major new authorities and new funding must be an integral part of any comprehensive legislation.

Finally, we believe that the legislation must address other Federal programs and policies. Coordination among agencies must be improved, and in some cases, programs must be redirected to support new coastal policies.

At the Department of Agriculture, for example, some programs actually destroy coastal wetlands and lead to increased pollution loading. The new legislation should make sure that all Federal activities are consistent with the goal of protecting the Nation's coast.

These are our primary recommendations for the overall goals for the new legislation, and thank you for the opportunity to present our views.

Senator LAUTENBERG. Thank you very much, Mr. Fox.

Mr. Brouha.

STATEMENT OF PAUL BROUHA, LEGISLATIVE COMMITTEE, FISHERMEN INVOLVED IN SAVING HABITAT

Mr. BROUHA. Mr. Chairman, I thank you for the opportunity to appear before you today to present the views of FISH, Fisherman Involved in Saving Habitat, regarding the protection of coastal areas from the effects of pollution.

I am Paul Brouha, the Deputy Director of the American Fisheries Society, which is a member of this coalition for the conservation of aquatic habitat.

FISH's mission is to elevate to the highest levels of Government the need for a National policy to protect, conserve, enhance, and restore the quality and diversity of fisheries habitat throughout the Nation.

We represent all segments of the fishery community, including commercial fishermen, processors, distributors, recreational anglers, tackle manufacturers, conservation organizers, the scientific community and fisheries managers.

We are all concerned about the serious loss and continuing degradation of fish habitat. The health of fish populations is tied to the quality of the Nation's waters, and as the panelists said before me, that means both inland as well as coastal.

The quality of these waters has deteriorated steadily since the beginning of the Industrial Revolution, and the pace increased dramatically under the impact of the Chemical Revolution during this century.

Until about 20 years ago, the Nation had not begun to address these problems of water quality loss. Now, a lot of progress has been made, but the goal of the Clean Water Act when it was passed in 1972 to have 100 percent fishable and swimmable waters by 1985 continues to elude us.

The fishery benefits currently at risk include 60 million sport anglers who spend about $30 billion a year in pursuit of fish; 700,000 full-time jobs derived from recreational fishing; more than 1 billion bays of users for recreation, angling recreation, and commercial fisheries contributing about $30 billion in economic activity to the Nation's Gross National Product.

Now, we can argue about these figures, perhaps, and how much is attributable to marine resources versus inland, but there is one point that we cannot argue about, and that is that we derive these benefits with very, very little public investment.

My written testimony goes into a discussion of pollution, the types and effects of pollution affecting our fisheries, but acknowledging your familiarity as well as that of the rest of the Committee Members, in the interest of time, I am going to skip directly to our recommendations to reducing water pollution, which are on the second to the last page—that is, page 5.

FISH endorses the following key finding of a recent OTA study of marine and estuarian waters: in the absence of additional measures to protect our marine waters, the next few decades will witness new or continued degradation in many estuaries and coastal waters around the country, including some that have exhibited past improvements.

Now, FISH believe this observation is applicable to all the waters of the United States. As a result, FISH is delighted to support these four bills as a means to strengthen and define the coordinated implementation of the Clean Water Act, and to foster better coordination of marine and estuarian research among all participants.

FISH is especially pleased to notice Section 15 of S. 1179, which requires a comprehensive study of Federal agency activities which may result in the degradation of the marine environment. A suggestion for improvement, perhaps, is to expand that study to address all Federal agency actions affecting the marine environment.

Such an expansion would clearly document the duplicative beneficial Federal agency programs that compete with each other for scarce appropriations, often to the detriment of the entire Federal effort.

While endorsing the strengthening of the Clean Water Act, as these bills suggest, FISH emphasizes its conviction that existing legislation is adequate to ensure sharp improvements in the quality of the Nation's waters, inland and marine. The laws are in place, but the execution of the requirements of the statutes is deficient. There is not enough emphasis given to enforcing existing laws.

FISH urges that the Clean Water Act regulations be enforced vigorously, that the Administration take the initiative and the Congress support that action to fund the Clean Water at the maximum authorized levels, or $18 billion through 1994, that the present nonpoint source provisions of the Clean Water Act and the Soil Erosion Control Provisions of the 1985 Farm Act be fully implemented with the best management practices required, that the health of fish populations be used to measure the attainment of water quality standards under the Clean Water Act.

Whether this is done by the States or the Federal Government, we have to make a better tie to the beneficial uses of the water when we set Clean Water Act standards.

EPA should use its existing resources to ensure the health of fish and prevent bioaccumulation of toxins in aquatic organisms, and that EPA's industrial and municipal waste pretreatment requirements be enforced.

Fish and fishery resources are a neglected resource offering the potential for important economic advantage, a source of healthful and abundant food for humans, and a source of recreational opportunity for all our citizens. The health of fish resources reflects the fundamental quality of the world's waters, including the oceans, and FISH is convinced that strong, effective actions to protect the aquatic resources of the United States must be taken now, if this treasure is to be maintained for future generations.

Thank you.

Senator LAUTENBERG. Thank you very much, Mr. Brouha.

Mr. Patterson, we are pleased to have you here and invite you to give your testimony.

STATEMENT OF ROBERT PATTERSON, EXECUTIVE DIRECTOR, CAPE MAY COUNTY CHAMBER OF COMMERCE

Mr. PATTERSON. Thank you, Mr. Chairman.

My name is Robert Patterson, and I am the full-time paid executive of the Cape May County Chamber of Commerce.

I am also currently serving as President of the New Jersey Travel and Resort Association, which is a volunteer position. And I have just completed two terms of service as Chairman of the Southern Shore Regional Tourism Council of New Jersey.

I want to thank you for the opportunity to present to you some of our concerns and comments relevant to the tourism and travel industry and our environment.

The Cape May County Chamber of Commerce has just completed a marketing study and survey of its tourism industry. This study was prepared and conducted for us by Stockton State College's South Jersey Center for Public Affairs.

One pertinent fact to this hearing today pointed out—that 92 percent of the respondents, of which there were 500 polled, ranked a clean environment as their most important factor in selecting a vacation destination.

A random survey of people who canceled reservations in 1988 indicated that 15.4 percent cancelled because of pollution.

The New Jersey Shore resorts, like other coastal States, have one major asset to sell, promote, and attract visitors with, and that is our ocean and beaches, or sand and surf, as we like to call it. Anything that affects the quality, the cleanliness and the accessibility of this beach and ocean is of the utmost importance to us and our economic livelihood.

Ocean dumping is currently of the utmost concern to us, for the popular perception depicted by many people is that our ocean is being fouled by all kinds of garbage, debris, waste and sludge. It is apparent that both legal and illegal dumping in the ocean has caused us reputable harm, both economically and environmentally.

We have publicly called for and sought a ban on ocean dumping of garbage, trash, sludge, toxic waste, and medical waste. We have also sought the relocation of wood burning at sea, as well as a seasonal ban on all ocean wood burning during the resort season.

Two years ago, our Chamber of Commerce started an environmental defense fund to back up our position on keeping our oceans and beaches free of pollution. We established a $2,000 reward fund, as well as printing 50,000 postcards addressed to our Governor for residents and visitors alike to sign and mail, and we are told that the Governor received over 30,000 of those postcards calling on him to stop ocean dumping in New Jersey.

We spent several thousand dollars more flying aerial banners up and down the county and New Jersey coast, calling for a ban on ocean dumping, to emphasize our point and to prove our concern and commitment to cleaning up our environment.

A tourism marketing survey conducted by the New Jersey Division of Travel and Tourism in the late summer and early fall of 1988 showed there was a 22 percent drop in visitor- vacationers to New Jersey in 1988 from the 1987 survey figure. This converts to 2 million fewer visitors, and $700 million less dollars than the year before.

The State study showed that among those people who said they would not come back to the shore, 44 percent cited concerns about pollution.

Tourism in New Jersey is an $8 billion a year industry. It is the largest generator of jobs in New Jersey, and supplies our State with a large amount of tax dollars. Witness if you will the recent wrestling match with our tight State budget due to the loss of tax revenues.

We have a particular concern for the materials being dumped currently at the 106 mile site off the coasts of South Jersey and Delaware. We are under the impression that all dumping of toxic waste chemicals has finally stopped there.

However, we are concerned about the sewage sludge being dumped there by several North Jersey and New York towns, and sewer authorities who treat toxic waste as well as their sanitary sewage wastes.

We are pleased to see this new legislation calling on the EPA to develop and promulgate standards for toxic pollution in coastal waters, as well as using the National Toxic Release Inventory to assess major sources of toxic discharges.

We also feel that site 106 is one of those designated areas requiring EPA and NOAA to conduct a continuing assessment of the area.

Tourism is projected to be the largest dollar and job-producing industry Nationally by the year 2000. While not all tourism on a National level is dependent on a clean environment, the 14 East Coast States, the Gulf Coast and the West Coast States will be largely dependent on a clean and safe marine environment for their future tourism economy and success.

Our current tourism season in New Jersey is still very spotty and fragile. We feel we must prove ourselves for a whole season without any major pollution incident before we can win back our millions of vacationers and visitors.

Ocean and marine pollution is a large and critical problem, and must receive Federal attention and leadership with cooperation and support from all the States and regions involved.

I thank you kindly for your attention.

Senator LAUTENBERG. Thank you very much, Mr. Patterson. I am pleased to note that you expressed your concerns about ocean dumping. Very soon, the Ocean Dumping Act, which we put into law here is going to end sludge dumping. It is going to be very much on target, that the various sewage authorities, including New York City, have entered into agreements with EPA to stop ocean dumping of sludge by 1991, perhaps with an exception in one case to 1992. But it is now in its terminal stages, which makes us all very happy.

I also would like to point out to you that on the enforcement side, a tugboat operator responsible for towing barges out to the 106 mile site was recently indicted and perhaps maybe even convicted for getting rid of its waste material before it made the full journey.

So there is enforcement out there and the ocean dumping of sludge, at least, is about to come to an end.

Hopefully with our medical waste tracking system, with our plastics prohibition legislation, legislation that was enacted out of this committee, signed into law by the President—and I was a very active factor in those pieces of legislation—we are beginning to see the effects of that.

The ocean is definitely cleaning, and I think Mr. Brouha mentioned that although we had a target for 1985 that is long since passed, and we have not reached the achievement levels that we wanted to, all of us can imagine very quickly what it would have been like had we not put the effort in that we have put in, and that at least we are beginning, if not to gain on it, to stabilize it somewhat.

We see vast numbers of salmon swimming up the Hudson River. True, they carry some materials that we would like not to have on our dinner table, but the fact is that Nature responds so effectively when given half a chance. If you untie her hands, she is right back in the battle. But we have to give her a chance.

Again, you may have heard that I was just up in Alaska, and had the privilege of walking and fishing the streams and seeing the bears and the other animals that have had an opportunity to live in an environment that is conducive to their propagation.

We see these representatives of history, and of the beginning of our world, still there, if we take a little time to take care of them. Salmon are in abundance in some places. Unfortunately, we are going to pay a big price for the oil spill.

So we have, all of us, business, recreation and commercial interests, pure environmental interests, coming together in a very aggressive way, and it pleases me to have your testimony and your support.

Mr. Patterson, business this summer, you say, is spotty?

Mr. PATTERSON. Spotty, and very fragile. Weak.

Senator LAUTENBERG. Weak?

And you think that is a carryover from the stigma that was created as a result of the information, the pictures of the unpleasantness of the material floating all over?

Mr. PATTERSON. Yes, Senator Lautenberg. No one wants to go to the beach if their kids are going to have to dodge the dirt and tiptoe lightly through syringes and that kind of stuff. I mean, that is hardly their recollection that people my age, anyway—or even people some of your ages, perhaps with the exception of Mr. Fox—recall of our day at the beach.

I am assuming that his youthful physiognomy reflects a difference in age. Maybe not, Mr. Brouha—but in any event, it is hardly a thing to look forward to, and it discourages people and it presents us not just with the economic disadvantage of lost income, lost investments made poorer by conditions other than management, but also its effects, ultimately, on the food chain and the ecological structure of the world that we live in.

Senator LAUTENBERG. How do we get the National Chamber of Commerce, Mr. Patterson, to develop an interest in pollution prevention and providing funding for cleaning up the environment, and remind them that when we have a cleaner environment and a more healthful environment, it is ultimately good for business.

And what is good for people certainly ultimately should be good for the Chamber of Commerce, and I ask you to use your influence, coming from an important community like Cape May.

Mr. PATTERSON. I certainly will.

Senator LAUTENBERG. Get back there and discuss it with others.

The three of you represent important users of the marine resources. What are the most important additional efforts that we need to take to protect the uses that each of you is concerned with?

Mr. FOX. I think the legislation needs to see very strong, specific initiatives in the area of water pollution control. Certainly we have heard this morning that one of the areas that it does not go far enough in is the question of coastal development.

When you look to the future, and you talk about wanting an insurance policy that these problems are not still going to be around in 20 years, or in fact 50 years for my children, it is going to be coastal development that we really have to get a handle on.

Again, I do not think it necessarily has to be in such a way that the Federal Government is involved in all local land use decisions.

The State of Maryland came out with a very progressive critical areas commission which set up State-wide criteria that the local governments had to meet. And it has proven very successful in helping to maintain some of the rural character of the Eastern Shore of Maryland.

Senator LAUTENBERG. Some of the most obvious differences between States are those which permit private ownership of beachfronts and some of those that do not.

All of these things have to be reckoned with when you consider coastal zone use. Is the public getting its fair share of access to these resources, or are we simply setting aside for the wealthiest in this country those private treasures that ought to be available in some way to all of us?

Mr. Brouha, what do you think we ought to do as a primay to promote the uses that you are concerned with?

Mr. BROUHA. Oh, I think that as was pointed out by Senator Chafee, we are looking at a time in the very near future when we will have three-quarters of our population living within 70 miles of our coast. Certainly that gives me pause to certainly endorse Mr. Fox' sentiments, but as regards fish, I think, as I stated in my testimony, that creating a very rigorous enforcement climate for existing laws and adequately funding Section 319—a very good example—is probably one of the most significant things that we can do right now.

We just simply have not put a sufficient priority on as a society, and as you noted, Nature has a marvelous capability to heal herself if we give her the opportunity. But if we continue to insult the capability to produce the biological system, we will not be able to get that back after a period of time.

Senator LAUTENBERG. Mr. Fox, last year the environmental community issued a report titled "Saving Our Bays, Sounds, Great Lakes: The National Agenda."

Are the provisions in the bills before us today consistent with the recommendations in that report?

Mr. FOX. I was pleased to be a part of the conference steering committee for the event that you talk about.

It was hosted by Save the Bay in Mr. Chafee's home State of Rhode Island. And I am pleased to report that yes, by and large, many of the provisions in that comprehensive citizens' agenda are included in this legislation.

Again, the one area that I would emphasize, though, has to do with land protection, and specifically habitat protection and wetlands and some of the areas that would need further attention to be really very much in line with those recommendations.

Senator LAUTENBERG. Thank you all very much.

Your testimony has been of value. We hope that you will see it incorporated into legislation that gets to the President's desk and gets signed. The worst thing to do is predict outcomes in this place, but I will run the risk of saying that you will see some kind of legislation that addresses these problems, and we will continue to build on whatever it is we do.

One thing that we know: the dynamics of the environmental needs of our world, that a step, no matter how large it appears to be, is only a first step. We have a long way to go, and we are pledge to hold the course.

So we thank you very much.

This subcommittee hearing is concluded. We will have our next hearing on the 25th of July, to further review these bills, and invite any of those interested to join us, at least as members of the audience, if not as witnesses.

[Whereupon, at 11:57 a.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record and the bills S. 587, S. 588, S. 1178, and S. 1179 follow:]

TESTIMONY OF DR. HOWARD LEVENSON

OCEANS AND ENVIRONMENT PROGRAM
OFFICE OF TECHNOLOGY ASSESSMENT

BEFORE

THE SUBCOMMITTEE ON SUPERFUND, OCEAN, AND WATER PROTECTION
AND
THE SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
OF
THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ON

RESEARCH AND PROTECTION OF MARINE WATERS

JULY 12, 1989

Mr. Chairmen:

I am Howard Levenson, and I was the project director for the Office of Technology Assessment's study on land-based sources of marine pollution, entitled *Wastes in Marine Environments*. The report was issued in April 1987.

OTA's major technical finding was that many U.S. estuaries and coastal waters will continue to degrade or begin to do so during the next few decades unless additional protective measures are taken. From a policy perspective, the major questions were whether all "needy" waterbodies will receive adequate management, and whether existing and planned mechanisms at all governmental levels will be used effectively to provide such management.

I want to congratulate you for developing substantive legislation to address these problems. Although some positive steps have been taken since OTA's report was released, our conclusions have not changed -- indeed, events during the last two years have confirmed them. There is now a large consensus among public interest groups and local, State, and Federal officials that additional steps are needed, although the details of such steps are often debated.

In this testimony, I will describe: 1) the seriousness and extent of the problems, 2) the adequacy of current U.S. management strategies, and 3) what a more protective approach might look like and how the legislation being considered today supports such an approach.

SERIOUSNESS AND EXTENT OF PROBLEMS

Estuaries and coastal waters have been used for years by coastal communities and industries for the disposal of various wastes (e.g., municipal sewage effluent and sludge, industrial effluent, dredged material). Such disposal, whether via dumping or pipeline discharge, has been relatively cheap and has solved some short-term waste management problems on shore.

At the same time, estuaries and coastal waters are the most important of all marine environments, with respect to their commercial resources, recreational uses, and ecological roles. They provide habitat during critical portions of the lifecycles of roughly two-thirds of the fish and shellfish caught in U.S. marine waters. The value of commercial and sport fishing has been estimated at over $10 billion, and tourism and other recreational pursuits in the associated shoreline areas is the lifeblood of many communities. As a result, individual citizens and fishermen, towns, and county and State governments have grown increasingly concerned about the impacts of waste disposal on harvests and tourism and on the property values of real estate located near these waters.

The OTA report documented numerous effects around the country:

- low dissolved oxygen levels leading, for example, to fish kills;
- contamination of shellfish with microorganisms, leading to restrictions on about one-third of our productive shellfish areas;
- contamination of shellfish, fish, birds, and mammals with metals and organic chemicals, in some cases leading to ulcers and tumors;
- declines in submerged aquatic vegetation;
- contamination of sediment with metals and organic chemicals;
- restrictions on fishing and consumption of certain fish species;
- restrictions on swimming; and
- increased reporting of human diseases such as viral gastroenteritis.

The degree and distribution of these impacts has varied widely among different waterbodies and organisms, but no region of the country has been immune to serious impacts. Public attention has focused mostly on the northeastern United States (e.g., the Chesapeake Bay and the New York Bight), southern California, and Puget Sound. Serious effects, however, also have occurred or are beginning to occur in the less-publicized (and relatively less-studied) Gulf of Mexico and along the southern Atlantic coast.

As a result, OTA concluded that without additional protective measures, the next few decades will witness new or continued degradation in many estuaries and some coastal waters around the country, even in some that showed improvements in the past.

OTA also concluded that on a national scale, industrial and municipal pipeline discharges are at least as important as dumping in contributing pollutants and causing damage to marine resources. Combined (storm and sanitary) sewer overflows also are important sources of pollutants in some areas. Runoff or nonpoint source pollution from agricultural lands and urban areas -- although not classed as a disposal activity -- also contains large amounts of certain pollutants (such as suspended solids, fecal coliform bacteria, nutrients, pesticides, and some metals) and enters marine waters in large quantities. In some waterbodies, runoff is considered the leading cause of degradation.

Concerns heightened in 1987, when several incidents focused public and government attention on the quality of U.S. marine waters. These include the infamous barge of trash that wandered to three countries before returning to New York; the deaths of hundreds of dolphins along the east coast; and the washing ashore in New Jersey of illegally dumped medical wastes during the height of the summer tourist season. The summer of 1988, of course, saw wash-ups of medical wastes on the beaches of numerous States, as well as continued occurrence of the effects listed above. By the first day of summer 1989, dozens of beach closings related to sewage contamination and medical waste wash-ups in eight States had been reported.

Although the OTA report focused on land-based sources of marine pollution, such pollution is not the only way in which marine waters can be degraded. Another potential source of pollutants is acid deposition from the air. A 1988 study by the Environmental Defense Fund sparked interest in this, and I note that S. 1178 and 1179 would require EPA to study this source.

Moreover, we cannot forget that "non-polluting" activities also greatly affect marine waters. OTA and many others have noted that filling of wetlands, channeling or diversion of rivers, and overharvesting significantly affect marine waters and resources throughout the country. All of these, but especially the first two, are frequently related to the increased pace of development along our marine shorelines.

About three-fourths of the U.S. population is expected to live within 50 miles of a coastline, including the Great Lakes, by the end of this century. As might be expected, this will mean increased development and redevelopment along shorelines, which in turn will entail both habitat modification in some cases and increased pollutant inputs into marine waters in almost all cases.

Among these degrading activities, the issues of nonpoint pollution from agricultural areas and of coastal development patterns have received little Federal attention. Both are related to land-use planning, which traditionally has been a matter for local and State consideration. Many observers have identified land-use planning as a critical factor in determining the pace and extent of development and in controlling agricultural nonpoint pollution.

ADEQUACY OF U.S. MANAGEMENT EFFORTS

Two statutes form the basis of most Federal regulatory efforts to combat marine pollution: the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the Clean Water Act (CWA). The MPRSA regulates the dumping of waste material in coastal and open ocean waters, while the CWA has jurisdiction over pipeline discharges in all marine waters, dumping in estuaries, and (theoretically) runoff.

The MPRSA and CWA use pollution control strategies based both on marine quality standards and on emission standards. The pollutant control programs under the CWA and the dumping criteria and permitting procedures under the MPRSA have helped reduce the amounts of pollutants entering marine waters. Under the CWA, the construction or upgrading of municipal sewage treatment plants -- towards which the Federal government has contributed over $44 billion during the past 15 years -- has led to increased oxygen levels and decreased nutrient levels in some estuaries and coastal waters. The CWA also has succeeded in reducing the levels of some metals and organic chemicals in industrial discharges into marine waters. The MPRSA, despite the controversy over the dumping of municipal sewage sludge, has been effective in regulating dumping in coastal waters and the open ocean; in particular, the dumping of industrial wastes has declined dramatically since the early 1970s.

However, these provisions have not protected some estuaries and coastal waters from degradation associated with waste disposal. OTA's analysis of this situation focused on the CWA, because it is the primary statute covering pipeline discharges and runoff -- the most important sources of pollutants entering estuaries and coastal waters. Only partial implementation of the relevant CWA provisions has been achieved to date, and the prospect of achieving full implementation and enforcement is unlikely.

Moreover, even with total compliance, existing regulations still will not be sufficient to maintain or improve the health of all estuaries and coastal waters for several reasons:

- current programs do not address all important toxic pollutants;
- current programs do not adequately address runoff;
- pipeline discharges and urban runoff will increase as population and industrial development expand in coastal areas; and
- Federal resources for sewage treatment are declining, and the ability of States and communities to fill the breach is uncertain.

These problems arise partly because the United States has been unable to develop a comprehensive pollution control strategy, one that simultaneously considers multiple environments, types and sources of pollutants, and exposure pathways. For example, the laudable reduction of "conventional" pollutants (e.g., suspended solids, fecal coliform bacteria) in municipal ~~sewage eff~~luent also resulted in the increased production of sewage sludge. Everything must go somewhere.

In recent years, consensus has developed about the need for a more comprehensive waste management strategy. In particular, many observers have concluded that some pollution problems, including those in marine waters, might be alleviated if policy choices about waste disposal were made within a broader context that takes into account the entire "system" that generates pollutants. For example, to the extent that waste generation can be reduced or that wastes can be recycled, then the need for disposal in different environments can also be reduced. If maintaining or improving the health of estuaries and coastal waters is desired, then any attempts to reduce or reuse the wastes now disposed of in these waters would be helpful.

However, little attention has been given to waste reduction efforts.. There is a clear need for greater incentives to reduce the generation of wastes as the best means of reducing waste disposal-related risks.

Unless such incentives are in place, and until they have been shown to be effective, large amounts of municipal wastes, industrial wastes, and dredged material will continue to require disposal for the foreseeable future. These wastes will continue to contain various pollutants, thereby limiting possibilities for their beneficial re-use (e.g., sewage sludge must be relatively uncontaminated if it is to be used on cropland).

In addition, pressures to continue current disposal activities in estuaries and coastal waters will increase. This is because large amounts of wastes are generated by major urban areas located close to marine waters; coastal populations and development are increasing rapidly; and land-based disposal of most of these wastes is limited by economic feasibility, public opposition, and regulatory restrictions.

PROTECTING MARINE WATERS

Various strategies might help to maintain or improve the health of our estuaries and coastal waters. To begin, the current system under the CWA could be improved by increasing enforcement, expanding controls to cover a broader range of toxic pollutants and industrial sources, and promoting reduced generation of wastes. Several key provisions in S. 1178 and 1179 adopt this strategy:

- strengthening the industrial pretreatment program;
- regulating combined sewer overflows and stormwater discharges into marine waters;
- requiring an inventory of releases of toxic substances and a strategy to combat subsequent problems;
- applying ocean discharge criteria to all marine discharges;
- extending the concept of marine criteria from its focus on water quality to the development of criteria for other measures of environmental health, such as habitat and sediment quality; and
- linking permit renewals for discharges with a determination that available waste minimization practices are being fully applied.

This strategy will strengthen our existing regulatory tools. It will likely be sufficient to stem problems in some marine waters, but it will require some combination of continued Federal, State, and local investments in enforcement efforts for all regulations, as well as industry investments in changing processes and technologies to comply with these regulations. The development of additional marine criteria will be difficult, but it would provide an important tool in future permit evaluations.[1]

It also will require monitoring and research, for purposes of enforcement and evaluating long-term trends. The bills before you contain many provisions regarding research, for example on atmospheric deposition, algal blooms, monitoring of floatables, monitoring protocols, and health and economic impacts. They also call for protocols for monitoring, protocols that would require the use of whole effluent biological toxicity testing. As testimony given to the subcommittees earlier this year indicated, biological testing on the toxicity of whole effluents may be more indicative of the seriousness of pollution problems than is current more restrictive testing.

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[1] Note that S. 1178 would require the Federal government to develop standards rather than criteria. This would represent a major change from the current procedures, in which the Federal government develops criteria and then each State develops standards, based on the Federal criteria, for its own waters. The latter approach is considered in S. 1179.

S. 587 also would establish regional marine research programs. If the research conducted by these programs is properly coordinated with ongoing research efforts conducted by NOAA, EPA, and other Federal and State agencies, then the regional research strategy could greatly enhance our ability to examine site-specific problems. In particular, it could provide flexibility to conduct new research that standardized national monitoring and research programs cannot conduct.

With respect to nonpoint pollution, the Water Quality Act of 1987 authorized EPA to administer a nonpoint pollution program. In the program, States are to identify waters not expected to meet water quality standards because of such pollution and submit a management program to EPA. However, Congress has not yet appropriated money for this program. Some States have developed programs to address nonpoint pollution, but in general there has not been a serious look at the problem with respect to marine waters.

The pending legislation would help this situation in some ways: 1) identifying croplands that, if enrolled in the Conservation Reserve Program, would reduce nonpoint pollution; 2) establishing a voluntary registry of coastal lands, owners of which would receive information about practices to help protect marine waters; 3) requiring the regulation of stormwater discharges; and 4) establishing the eligibility of nonpoint pollution programs for grant assistance. However, it is unclear what specific allocations will be made available to EPA and the States to implement these provisions. In addition, both EPA and the Department of Agriculture need to seriously evaluate the possibilities for increased Federal involvement in solving nonpoint pollution problems.

The strategy of strengthening the CWA provisions and increasing research will not be sufficient in many other areas because of runoff, increasing development, and other problems. A more comprehensive approach is needed. Many areas will require additional forms of management that use a broader, ecosystem-oriented planning approach -- i.e., on a watershed, drainage basin, or waterbody basis.

The Federal government and some States have already recognized this need and developed what OTA calls "waterbody management" programs to attack site-specific problems that cannot be handled by existing CWA programs. The Chesapeake Bay Program (a joint effort of EPA and several States) and the Puget Sound Water Quality Authority (a State program) are two well-known programs. These programs attempt to bring together all parties with vested interests (including ones with authority to address land-use and runoff issues), identify the most important problems and their causes, and devise a long-term management plan to alleviate those problems. In essence, the programs use planning on an ecosystem basis to establish site-specific goals and identify the most environmentally and economically effective means of achieving those goals.

While this site-specific approach appears very promising, it is difficult to implement and it is still in its infancy. The approach has been partially institutionalized at the Federal level. In particular, the Water Quality Act of 1987 authorized several activities and programs, including the National Estuary Program. Under the National Estuary Program, EPA is authorized to convene management conferences for individual estuaries. Congress already has designated a number estuarine waterbodies that should receive priority consideration in EPA's plans for convening conferences.

A number of commercially important but degraded waterbodies have been included in the program through various pronouncements and activities by Congress, the States, and EPA. However, the process of selecting waterbodies has been ad hoc. There has not been a systematic, scientific identification of those waterbodies that need such management now or those that are not currently degraded but are likely to become so in the future.

The absence of a system for deciding when and how to provide additional, site-specific management raises several important questions about the relative roles of Federal, State, and even local governments. Will enough programs be developed and implemented? Should a national effort to select waterbodies and spur development of plans needed? Will existing State and Federal mechanisms be used effectively to provide such management?

Senate Bills 1178 and 1179 provide some important answers to these questions. In particular, they would:

- set up a systematic process for identifying marine areas in need of protection, including areas likely to become degraded in the future;
- require States to submit management strategies for each area to EPA, with specific issues to be addressed in the strategies; and
- require EPA to prepare such strategies in the event that States do not.

At EPA, for example, these provisions would extend the authorities of the National Estuary Program. The program should become a much more active participant and its coverage would now include coastal waters, not just estuaries. At the same time, care must be taken not to override existing State activities that achieve the same goals.

There is one important area that the Senate bills do not address -- coastal development and associated land-use planning. As I noted above, coastal development is increasing rapidly and is a major factor contributing to the degradation of some marine waters. Although land-use planning has traditionally been a local and State matter, the Federal government did enact the Coastal Zone Management Act. As written, the Act does encourage States to develop management plans for estuaries, bays, and harbors that balance economic development and environmental protection. More could be done to strengthen this approach, for example by providing incentives to States to develop such plans or by including State CZM offices in the management conferences conducted under the National Estuary Program.

CONCLUDING REMARKS

In conclusion, I want to stress that success in protecting estuaries and coastal waters will depend on involving local and State governments, the Federal government, the public, and the private sector for years to come. Obviously, this also will require more cooperative efforts among these groups. Success will also require much more emphasis on waste reduction and difficult decisions about land-use issues and coastal development practices.

It is important to recognize that these efforts must be sustained over for a long time. Success will not be achieved overnight -- in some cases, the time scales may be 50 years or more.

The Subcommittees have taken important steps in enhancing our ability to achieve the goal of protecting our valuable marine waters. Without such steps, we are likely to witness considerably more degradation of our estuaries and coastal waters.

STATEMENT OF

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U.S. DEPARTMENT OF COMMERCE

BEFORE THE

SUBCOMMITTEE ON SUPERFUND, OCEAN, AND WATER PROTECTION
AND THE
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
JULY 12, 1989

Mr. Chairman and Members of the Subcommittees:

I am Charles N. Ehler, Director of the Office of Oceanography and Marine Assessment of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. I'm pleased to be here to summarize results of NOAA's activities to assess long-term trends in coastal pollution and to discuss ways in which government at all levels can be strengthened to meet the challenge of improving the environmental quality of coastal areas throughout the United States.

Since the end of March, the EXXON VALDEZ oil spill and the three other recent incidents -- in Narragansett Bay, the Delaware River, and Galveston Bay -- have illustrated dramatically the immediate effects of pollution on sensitive coastal areas and their resources. In addition, medical wastes on East Coast beaches last summer illustrated the immediate effects of pollution incidents on valuable coastal environments, marine recreation and tourism, and local and regional economies. As dramatic as these events have been in the eyes of the American public, however, at least as important is the less visible, systemic deterioration of the quality of our coastal environment from chronic discharges of pollution into coastal areas, and the loss of important coastal habitats. Toxic pollutants from point and nonpoint sources, nutrients from wastewater treatment plants and agricultural sources, as well as the continuing destruction of coastal wetlands due to human activities, pose long-term threats to coastal resources.

I want to emphasize that the extent of the coastal pollution problem is truly national and not limited to only a few specific coastal or estuarine areas. Solutions to the problem will require an approach that is national in scope and scale. They will require a long time to identify and implement. They will require the commitment of all levels of government and the private sector.

Trends in Coastal Population

By the year 2000, it is projected that coastal areas in the U.S. will be the home of over 100 million people, about 38 percent of the Nation's population. This is significant because coastal areas of the contiguous United States account for only about 10 percent of the total land area. Coastal populations are large consumers of housing (and seasonal housing), water, and energy. They are also, as a consequence, major producers of solid waste and wastewater.

Coastal areas are centers of industry and commerce and, as a result, often the final resting places for the wastes generated in industrial production processes. In 1989, for example, coastal areas accounted for 28 percent of all U.S. hazardous waste sites, including 35 percent of the National Priorities List sites -- those having the highest priority for cleanup. Coastal areas will continue to be major population and economic centers into the next century, and they require effective management to ensure that environmental quality is not stressed further.

Trends in Pollutant Discharges

Pollutant discharges to coastal areas are significant and will increase as population and industry continue to concentrate along the coast. While only about ten percent of the Nation's 66,000 point sources are located in coastal areas, they contribute over one-third of the total annual wastewater discharged throughout the country. Over one-fourth of the 2,900 major wastewater treatment plants (greater than one million gallons per day) in the United States are located in coastal counties, reflecting the concentration of population in these areas. Yearly sludge production associated with these plants is currently estimated at 3.4 million dry tons and is projected to increase 80 percent by the year 2000. As space for landfills in coastal areas becomes more scarce and environmental regulations more stringent, finding acceptable disposal methods for sludge will be increasingly difficult.

Trends in Toxic Pollution in Coastal Areas

For each of the past five years NOAA's National Status and Trends (NS&T) Program has been monitoring systematically estuarine and coastal sites to determine the concentration of toxic pollutants in mussels and oysters, bottom-feeding fish such as flounders, and sediments. Since 1984 we have measured the concentration of synthetic organic compounds and heavy metals in fish and sediments at about 50 sites. Each year we have made some changes in the sampling locations. Since 1986 we have measured the concentration of these same pollutants in mussels, oysters, and associated sediments at an additional 150 sites.

The National Status and Trends Program is the *only national program that is using uniform methods to collect and analyze toxic pollutant concentrations in selected coastal fish, shellfish, and sediments to produce a consistent, high-quality data base with which to compare these concentrations across sites and to analyze trends over time*. We have placed special emphasis on quality assurance and quality control so that the scientific validity of these comparisons can be objectively judged. We are working with both the National Institute of Standards and Technology and the National Research Council of Canada on continuing performance evaluations to ensure consistency within our participating laboratories and comparability among laboratories. The pollutants that are monitored include: DDT and its metabolites; nine other chlorinated pesticides, including aldrin, ieldrin, and mirex; polychlorinated biphenyls (PCB's); 18 polycyclic aromatic hydrocarbons (PAH's); and 16 elements.

Sampling sites have been selected to be "representative" of general conditions within the areas in which they are located. Generally, sampling sites avoid point sources of contamination, such as outfalls from industrial or sewage treatment plants, because such "hot spots" are not considered to be representative of conditions within the larger water body.

Based on NOAA's NS&T Program, the high concentrations in bivalves (mussels and oysters) for the most pollutants were found in the Hudson/Raritan Estuary, Boston Harbor, Western Long Island Sound, Baltimore Harbor, San Francisco Bay, Delaware Bay, and San Diego Bay. The high concentrations of total PCB's in bivalves was found in Buzzards Bay, Massachusetts; total pesticides, both DDT and non-DDT, the Hudson/Raritan Estuary; total PAH's, Elliot Bay (within Puget Sound); for lead, Marina Del Rey; and for mercury, Tampa Bay.

The high concentrations of most pollutants analyzed from the livers of eight species of bottom-feeding fish (e.g., flounders, spot, and croakers) for the most pollutants were found at Southern California sites (e.g., Dana Point, San Diego Harbor, Seal Beach, and Santa Monica Bay), Western Long Island Sound, San Francisco Bay, and Elliot Bay. High concentrations of total

PCB's in fish livers was found in San Diego Bay; total pesticides, Boston Harbor; DDT's, San Pedro Canyon; lead, Casco Bay; and for mercury, San Francisco Bay.

Samples of sediments from NS&T sites have also indicated that the most contaminated locations sampled were in Boston Harbor, the Hudson/Raritan estuary, and sites around San Diego, Los Angeles, and Seattle. For the most part, NS&T sites in the Gulf of Mexico and the Southeastern United States had lower levels of contamination than sites sampled elsewhere in the country. However, near some Florida cities, including Jacksonville, Tampa, Panama City, and Fort Walton Beach, also had high concentration for some pollutants.

These data reveal the truly national extent of the problem of toxic contamination of sediment, fish, and shellfish throughout the coastal waters of the United States. There is some good news, however. Based on a NOAA analysis of historical monitoring data from 13 national programs, decreasing concentrations of DDT contamination of fish and shellfish are evident in most NS&T sites nationwide. Decreasing contamination of PCBs, dieldrin, and toxaphene in selected species at specific sites are also evident.

The National Status and Trends Program has analyzed the latest three years of NOAA data to look for trends in concentrations of pollutants in mussels at about 150 sites throughout the United States. Our objective is to monitor changes in pollutant levels associated with human activities and to assess the effectiveness of control strategies. Since our data are spatially and temperally limited, our analyses must be viewed as very preliminary and must be interpreted with caution. However, these data are among the first systematic signals of trends in national coastal environmental quality and will be more reliable as indicators as additional years of data are added.

Our preliminary results present a mixed picture of trends in coastal environmental quality, and indirectly reflect mixed results in our effectiveness in reducing levels of pollutants in coastal and estuarine environments through management actions. In general, classes of chlorinated organic compounds show a tendency to decrease rather than increase. This finding is consistent with the fact that uses of most of these compounds have been banned or severely restricted. Generally, levels of polychlorinated biphenyls, DDT, chlordane, and dieldrin, tend to be decreasing. Concentrations of high and low molecular weight PAH's varied between increases and decreases in our sampling. However, levels of the metals, mercury, selenium, and lead, appear to be increasing nationally, but cadmium levels tend to be decreasing.

Within individual coastal systems the picture is more complex. For example,in the Hudson-Raritan estuary and other New York Bight sites, levels of chlordane and dieldrin are decreasing, but levels of chromium, copper, mercury, and nickel are increasing. In Mississippi Sound and in Marina Del Rey near Los Angeles, levels of DDT in mussels, despite a ban on its use since 1973, are actually increasing. In Long Island Sound, the Delaware Bay, and Charleston Harbor, levels of cadmium are decreasing. The full report documenting these analyses will be printed by NOAA soon, and a copy will be provided to your Subcommittees.

Nutrient Discharges to Coastal Areas

Estuaries are positioned at the downstream end of coastal watersheds and receive water, sediments, and other materials from large land drainage basins. These materials include the continuous addition of nutrients from both natural and human sources. Some estuaries can assimilate large quantities of nutrients. However, excessive amounts of some materials can be highly detrimental to the estuaries and their uses. Increasing evidence of reduced fish catches, loss of habitats, and degradation in water and sediment quality caused by nutrient over-enrichment indicates that nutrient discharges must be limited. Estimates based on NOAA's National Coastal Pollutant Discharge Inventory, indicate that nearly 300 thousand tons of phosphorus and 1.8 million tons nitrogen are discharged annually into the Nation's estuaries. Twelve percent of the nitrogen and nearly 40 percent of the phosphorus are attributed directly to wastewater treatment plants. The Northeast region of the United States, with its large population, contributes the most nitrogen and phosphorus from wastewater treatment plants while the Gulf of Mexico, with large land areas devoted to crops, contributes the most from agricultural sources. Large fractions of both nitrogen and phosphorus discharges came from sources upstream of the primary estuarine drainage area.

Working closely with the Environmental Protection Agency's Office of Water, NOAA has begun a nationwide study to evaluate the status and susceptibility of the Nation's estuaries to excessive discharges of nutrients. From a preliminary assessment of almost 100 estuaries in NOAA's National Estuarine Inventory, we concluded that 41 are likely to retain nutrients for extended periods based on their flushing and dilution characteristics. Based on NOAA nutrient loading estimates, 29 are expected to exhibit medium to high concentrations of nutrients. Their sensitivity of estuarine biota, coupled with high nutrient loads, would make them good candidates for more detailed analyses and possible additional management actions to reduce levels of nutrient discharges within these estuaries.

Trends in Shellfish-Growing Waters

Based upon an examination of the quality of shellfish growing waters in over 100 estuaries, NOAA has determined that, in 1985, over nine million acres, 65 percent of the total waters suitable for shellfish growing, were approved for harvest. Twenty-one percent of waters not meeting approved standards were prohibited from use, 13 percent were conditionally approved, and fewer than one percent were restricted.

Two thirds of this approved area is found in the three largest East Coast estuaries: Chesapeake Bay (2.4 million acres approved), Pamlico Sound (1.3 million acres), and Long Island Sound (0.7 million acres). In these estuaries, almost 50 percent of classified acreage is not productive because of extreme salinities, or lack of suitable depth, substrate, or habitat for molluscan shellfish.

Most changes in classification (1971 -1985) are attributable to changes in administration of State shellfish programs based on a number of pollution sources. Northeast waters that do not meet approved National Shellfish Sanitation Program (NSSP) requirements are affected mainly by sewage treatment plants, combined sewage and urban runoff. In the Mid-Atlantic, boating activities have major impacts, in the Southeast, animal runoff is the major factor. Upstream sources affect over half of the harvest limited and most productive waters in the Gulf. West coast waters are affected by nonpoint runoff, particularly from animal sources.

A recently released series of NOAA reports detail the status of shellfishing waters of the United States. Since shellfishing waters are classified for the commercial harvest of oysters, clams, and mussels based upon public health concerns, we have assessed the impacts of this system and raised questions about the use of fecal coliform as the indicator of choice in the NSSP. Efforts are underway by Federal scientists, the private sector, and regulators to establish the relationships between pollution sources, indicators, and shellfish-borne disease.

The current trend is one of changes in primary harvest centers. Over the past 15 years, the East Coast industry has experienced a severe decline in shellfish available for harvest. This decline is a result of past overharvesting, shellfish mortality from shellfish disease and predation, and increased closures due to pollution.

In the oyster grounds of the Mid-Atlantic, the diseases, MSX and dermo, have devastated the resource. Harvest of oysters has shifted to the Gulf Coast. A decline in freshwater inflow is affecting the Gulf production, forcing the industry to increase culture and relay activities. In Maine, North Carolina and South Carolina, closures due to paralytic or neurotoxic shellfish poisoning caused additional closures beyond those experienced due to pollution. Clam harvests have shifted from coastal New York to the Indian River of Florida due partially to new Florida programs that allow for relay and depuration.

Trends in Coastal Wetlands

Coastal wetlands are one of our Nation's most important natural resources. They provide critical habitat for fish, shellfish and wildlife, filter and process agricultural and industrial wastes, and buffer coastal areas against storm and wave damage. They also generate large revenues from a wide variety of recreational activities such as fishing and hunting. Unfortunately, coastal wetlands continue to disappear in many areas at an alarming rate.

For example, in coastal Louisiana, the rate of loss of coastal wetlands has accelerated from about 5 square miles per year early in the century to approximately 50 square miles per year between 1956 and 1978. Recent studies suggest the rate of loss has slowed somewhat during the 1980's, but the rate still is approximately 40 square miles per year or about one percent of remaining wetlands per year. Losses such as these can have far-reaching effects. Based on long established relationships and studies demonstrating the dependency of coastal fish and shellfish on estuarine wetlands, NOAA has estimated that the loss of wetlands in the United States has resulted in losses of millions of dollars in fisheries products. Natural coastal and deltate processes coupled with human activities have accounted for the rapid loss of Louisiana's coastal wetlands. The long-term forces of subsidence, sea-level rise, saltwater intrusion, and erosion have been responsible for the natural loss of wetlands. Flood protection in the flood-prone lower Mississippi Valley and private-sector development have also caused wetlands loss. Furthermore, rising costs of and demand for waterfront property will cause increased competition in coastal areas for limited space. In the Southeast region (North Carolina to Texas) alone, from January 1981 to December 1985, the U.S. Army Corps of Engineers received over 27,000 proposals to alter wetlands.

NOAA's Role in Predicting And Preventing Coastal Pollution

Over the next 10 years, Federal and State governments will make decisions about the use of the coastal waters that will determine whether this economically and environmentally important area will continue to be a valuable national resource. NOAA plays a vital Federal role in developing and implementing solutions to many of the problems confronting the Nation's coastal waters. That role includes legislatively mandated responsibilities for living marine resources, as well as providing predictions, advice, and the sound scientific basis for environmental decisions made by other local, State, and Federal agencies. Simply stated, NOAA's role is to provide information to make effective environmental decisions possible. Increasing the capabilities of Federal and State decisionmakers to assess and predict emerging problems -- to address tomorrow's problems today -- is a goal of the National Oceanic and Atmospheric Administration's Coastal Ocean Program.

This focus on developing information for the Nation's coastal ocean decisionmaking is enhancing the nature of the traditional role of NOAA. It requires fundamental changes in the types of products developed; services provided; data collection, research, and assessment activities undertaken; and the timing and manner in which these products, information, and services are developed and delivered.

This changing environment is represented in the initiation of NOAA's Coastal Ocean Program. The Coastal Ocean Program began in 1988 with management initiatives toward revitalizing and refocussing its activities in support of three program goals:

1. Prediction of coastal ocean degradation and pollution
2. Conservation and management of living marine resources
3. Protection of life and property in coastal areas

The Administration's FY 1990 budget request, presently under review by the Congress, in addition to fully funding the National Status and Trends Program, focusses on activities within NOAA's Program goal for prediction of coastal ocean degradation and pollution. Our efforts are designed to improve NOAA's ability to monitor, assess, and predict coastal environmental change caused by pollution and other manmade and natural events. The products of these endeavors form important elements of coastal management strategies.

Strengthening Coastal Management

Clearly the Nation needs effective programs at all levels of government to manage the quality of its coastal resources. On several occasions the President has expressed his concerns about the health of our bays, estuaries, and wetlands throughout the country. Attacking the problems of coastal pollution will require a long-term, coordinated Federal-State approach, in concept similar to efforts underway to improve the Nation's air quality. Wetlands protection and water quality management in estuaries are important elements in coastal management programs of many States.

The Coastal Zone Management Program was established to create a comprehensive management umbrella for the beneficial use, protection, and development of the resources of our coastal areas. Over the past year, NOAA's coastal management program has worked closely with the Environmental Protection Agency's Office of Water to coordinate the efforts of State coastal management programs toward improving water quality with efforts to strengthen State and local management actions within individual estuaries included in EPA's National Estuary Program. For example, to the extent permitted by law, States will be required to submit Comprehensive Conservation and Management Plans developed under EPA's National Estuary Program for incorporation into approved Coastal Zone Management Programs after approval by the Governor(s) and the EPA Administrator. NOAA is also providing scientific support and technical assistance to EPA for the development of national guidance on the management of water quality programs to address more effectively the health of living marine and estuarine resources.

NOAA looks forward to continuing to work closely with other Federal and State agencies on strengthening our collective efforts to improve the quality of our coastal environments.

Mr. Chairman, this concludes my statement. I would be happy to answer any questions you might have.

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Testimony
# of the
Natural Resources Defense Council, Inc.
Before the
Subcommittee on Superfund, Ocean and Water Protection
and the
Subcommittee on Environmental Protection
# of the
Senate Committee on Environment and Public Works
Concerning Coastal Protection Legislation

July 12, 1989

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Mr. Chairman and members of the Committee, thank you very much for inviting the Natural Resources Defense Council[1] to testify on pending legislation to address marine and coastal water pollution. We are very pleased that Congress is taking additional action to combat the grave threats to public health, water quality and natural habitat that continue to plague our coastlines.

Introduction

Each year, industrial facilities discharge nearly five trillion gallons of wastewater into coastal and near-coastal waters. Another 3.6 trillion gallons of wastewater from sewage treatment plants are discharged into these waters each year.[2] Each time it rains or snows, contaminants including pesticides, excessive nutrients, sediments, medical wastes, and toxic metals and organic compounds are carried via surface flow and storm drains into the waters of our coasts. This poison runoff is exacerbated by the explosion of growth and development in the coastal zone.

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[1] The Natural Resources Defense Council (NRDC) is a national environmental organization with over 100,000 members. NRDC is dedicated to the wise use and conservation of our natural resources, and to the protection and rejuvenation of the environment for this and future generations. NRDC's interest in the protection of water quality and coastal resources dates back to the organization's founding in the early 1970's.

[2] Wastes in Marine Environments, U.S. Congress, Office of Technology Assessment (April, 1987) (hereafter "OTA Report"), at 70.

In April of 1987 the Office of Technology Assessment published its major report, "Wastes in the Marine Environment," providing a wealth of documentation of the many threats to marine waters. Among the report's most important conclusions were that:

- Unless more is done, new or continued degradation will occur in many of our estuaries and costal areas in coming decades -- even in those areas that have improved in the past;[3] and
- Even if total compliance with existing regulations is achieved, existing programs alone would not be sufficient to maintain or improve the health of all estuaries and coastal waters.[4]

These sobering predictions came to life all too soon during the summer of 1988, which brought numerous instances of beach closures due to sewage contamination and medical wastes that washed up on shore. Beach closures cost the states of New York and New Jersey an estimated $2 billion in tourism dollars in 1988,[5] and over 100 miles of beaches in these two states alone were closed due to medical waste wash-ups in 1987 and 1988.[6] This year, sewage contamination already has closed 44 beaches from Memorial Day weekend through June 21st in New York, New Jersey and Connecticut.[7] Eight states already have experienced medical waste wash-ups this year.[8]

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[3] OTA Report, supra, at 3.

[4] Id. at 7.

[5] See generally Douglas D. Ofiara and Bernard Brown, "Marine Pollution Events of 1988 and their Effect on Travel, Tourism, and Recreational Activities in New Jersey," Bureau of Economic Research, Rutgers University, and Marine Fisheries Administration, Fish, Game, and Wildlife, New Jersey Department of Environmental Protection (March 21, 1989).

[6] Testimony of Dr. R. Lawrence Swanson, Marine Science Research Center, SUNY Stony Brook, New York, before the U.S. House of Representatives, Committee on Merchant Marine and Fisheries, Subcommittee on Fisheries and Wildlife Conservation, concerning Coastal Pollution (Sept. 6, 1988) at 2.

Finally, the tragic -- and preventable -- Exxon Valdez oil spill into Alaska's once-pristine Prince William Sound, which left behind over 11 million gallons of oil soiling more than 800 miles of shoreline, brought home to Congress and the public our urgent need to protect coastal areas more effectively.

We welcome the introduction of S. 1178 and S. 1179, both as emblems of the degree of Congressional concern over the state of our coastal waters and because of the many positive provisions contained in the legislation. Both bills contain provisions that would make important strides in addressing coastal degradation problems. For example, we support the proposals to strengthen discharge controls in those estuaries and coastal waters that fail to meet the "fishable and swimmable" standard of the law.[9] We also support the proposals to eliminate combined sewer overflows, and to improve the scope and consistency of water and sediment quality standards.

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[7] Figures compiled by NRDC with the assistance of Rep. James Florio; see "The Natural Resources Defense Council Condemns Beach Closings and New Medical Waste Wash-Ups," press release, June 21, 1989.

[8] Id.

[9] In other words, waters that do not support a "balanced, indigenous population of shellfish, fish, and wildlife and allow for recreational activities in and on the water." See Clean Water Act sec. 101(a)(2); S. 1178 at Sec. 101.

However, we believe that more needs to be done to tackle the problems of poison runoff: contaminated runoff from urban, agricultural, and other lands that reaches coastal waters via surface flow and unregulated storm drains. According to EPA's 1986 water quality inventory, almost half of the Nation's polluted estuaries are contaminated primarily by poison runoff.[10] And more recent data suggest that the poison runoff problem may be even worse. In EPA's recent list of over 17,000 heavily polluted waters nationwide, less than 600 were contaminated entirely or substantially by point sources.[11]

The draft legislation does take aim at the problem of contaminated runoff. But while we support the proposed changes in existing law directed towards nonpoint source pollution abatement, we do not think that the proposals go far enough. Specifically, because the problems of poison runoff are inextricably tied to the level of development in coastal areas, more should be done legislatively to link the need for controls on coastal development to the protection of water quality.

In the testimony that follows, we outline the basis for our support of some of the legislation's most significant provisions, and offer suggestions for strengthening the proposals.

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[10] National Water Quality Inventory, 1986 Report to Congress, EPA-440/4-87-008 (November 1987) at 3.

[11] The waters were not broken down by inland versus coastal categories.

I. Point Source Controls

A. Stricter Controls in Degraded Waters

Strengthening controls on point source discharges will prevent further degradation of degraded waters.[12] Existing law and regulations already require the imposition of stricter permit conditions for discharges to degraded waters, and additional measures to assure that further degradation does not occur.[13] The proposed legislation would add even more specific requirements to ensure that water quality would not suffer as a consequence of point source discharges, and we strongly support such an addition to the law.

Current Clean Water Act antidegradation regulations require that discharges to waters that meet or exceed water quality standards -- i.e., still-pristine waters -- not degrade water quality unless and until the "State [has assured, among other things,] that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources..." 40 CFR §131.12(a)(2). If a means exists for a discharger into high quality waters to reduce its pollutant load via waste minimization, antidegradation requirements would mandate that it be implemented.

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[12] Section 102 of S. 1178 would create a new section 301(q) of the Clean Water Act, under which a permit to discharge to designated-degraded waters could be issued or renewed only if the discharger implemented all available waste minimization practices and offset any new discharge against a reduction in existing discharges.

[13] See CWA § 303; 40 CFR Part 131.

While the existing law thus already imposes a requirement that discharges to high quality waters be controlled to the "highest level", NRDC strongly urges an express expansion of the proposed legislation's waste minimization language to encompass discharges to **all** coastal waters, and not simply designated-degraded waters. It is far better to protect our high quality waters now than it is to wait until they have become degraded before imposing adequate controls. Moreover, from a technological standpoint, a discharger may be better served by having waste minimization requirements in place at the outset so that appropriate equipment and product design can be selected. A subsequent retrofit to meet more stringent requirements (if waters later become degraded or new pollutant sources place further stresses upon receiving waters) could prove costlier and could achieve less pollution control.

B. Improved Controls on Stormwater Discharges

We strongly support the requirement of permits for industrial and municipal discharges of stormwater in designated-degraded areas, following an expeditious timetable, as proposed in Section 101 of S. 1178. In fact, under existing law, stormwater discharges to degraded waters already are subject to permitting requirements immediately;[14] the proposed legislation would serve to reinforce this requirement.

Ironically, this legislation may be badly needed to fill a regulatory gap that EPA has proposed to create in order to circumvent an earlier Congressional mandate to deal with stormwater.

Under the mandate of the 1987 amendments to the Clean Water Act,[15] EPA was to have issued stormwater permit regulations for municipal separate storm sewer systems serving populations of over 250,000 by no later than February 1989. The Agency finally did publish proposed regulations,[16] but the proposal is severely flawed. Apparently in an effort to accommodate the resource concerns of municipalities and states, EPA illegally proposes to redefine "municipality" to include only incorporated municipal entities. Under this narrow proposal, only about twenty-five percent of the U.S. population overall would be covered by the rule, as opposed to sixty-six percent if the proposal were broadened to include counties.[17] Many of the nation's important high-growth areas, frequently clustered on the coasts, would be excluded if EPA finalizes this proposal. For example, none of Long Island would be covered; and the vast majority of New Jersey's heavily populated coastal counties would fall outside the "incorporated municipality" definition. And stormwater controls would be required in the District of Columbia, but not in Montgomery County, Maryland or Arlington County, Virginia.[18]

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[14] Section 402(p)(2)(E) provides that the exemption from stormwater permitting requirements set forth in section 402(p)(1) shall not apply to

> A discharge for which the Administrator or the State, as the case may be, determines that the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

This provision has been used sparsely, if at all. In a designated-degraded area, stormwater contaminated with urban, industrial or agricultural pollutants clearly would "contribute to a violation of" water quality standards and would be subject to immediate permitting.

[15] Section 405 of the 1987 Water Quality Act created sec. 402(p) of the Clean Water Act, pursuant to which operators of municipal separate storm sewer systems serving a population of 250,000 or more were to apply for permits within 3 years and obtain them within 4 years.

[16] Although final regulations were due in February 1989, EPA now does not plan to complete them before April of 1990, fourteen months late. EPA Semiannual Regulatory Agenda, 54 Fed. Reg. 17258, 17285 (April 24, 1989).

This misguided EPA proposal has not been finalized into a rule as yet. Perhaps the language in S. 1178 would discourage EPA from going forward with the narrow "incorporated municipality" approach by emphasizing, yet again, that Congress wants contaminated urban stormwater to be controlled and treated as quickly as possible.

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[17] The Clean Water Act defines "municipality" very broadly, to include a "city, town, borough, county, parish, district, association or other public body . . . having jurisdiction over disposal of sewage, industrial wastes, or other wastes . . . ." Clean Water Act Sec. 502(4).

[18] For a more detailed discussion of the gross deficiencies in EPA's proposed stormwater regulations, see "Comments of the Natural Resources Defense Council, Inc. on EPA's Proposed NPDES Application Regulations for Stormwater Discharges, 53 Fed. Reg. 49416 et seq." (March 7, 1989).

Another major deficiency in EPA's proposed stormwater permit application regulations is that they lack any specific minimum treatment standards which a discharger would have to meet in order to obtain a permit. In other words, the proposed rules offer a "shell" calling for the submission of permit applications, but leave the states with total discretion as to the level of treatment their permits must require. It is a "write your own permit" program, which could have little effect on coastal water quality.

To fill this vacuum, we urge Congress to specify in the marine stormwater permitting provision some of the key permit elements (including both treatment requirements, such as definitions of acceptable treatment levels or pollutant reductions, and programmatic elements, such as adequate authority and financial resources to issue and enforce permit limits) to be included in the permits that would be issued to municipalities and industries discharging stormwater into degraded coastal waters.

C. Combined Sewer Overflows

The term "combined sewer overflow" (CSO) is just a euphemism for a hole in the sewer pipe from which pours raw, untreated sewage and untreated or inadequately-treated industrial and medical wastes, along with contaminated stormwater from city streets. CSOs are a major cause of water quality problems in coastal areas, particularly beach closures and shellfishing bans due to bacteriological contamination.

The problem of CSOs is significant. EPA estimates that there are between 15,000 and 20,000 CSO discharge points currently in operation.[19] About 2300 are located in coastal counties.[20] Thirty-six of the nation's one hundred largest (by volume) sewage treatment plants have combined sewer overflows; of those, thirty are located between Virginia and Massachusetts and twelve are in New York.[21] New York Harbor is a case in point. Close to 500 CSO points release 560 million gallons of untreated sewage and other wastes during an average 7-hour storm.[22]

Combined sewer overflow points constitute point source discharges that today are subject to the permitting requirements of the Clean Water Act.[23] But, as both S. 1178 and S. 1179 recognize, at present many CSOs remain completely unregulated and efforts to eliminate the discharges or to provide adequate wastewater treatment lag far behind the control of sewage from other sources.

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[19] EPA, "Interim Final National Combined Sewer Overflow Control Strategy," Jan. 27, 1989 (hereafter CSO Strategy) at 1.

[20] Al Reilly, "Marine CSOs: The Problem and the Solution," unpublished paper, 1988, at 2.

[21] Id.

[22] Report to Congress, March 1989, on the New York Bight Plastics Study, Section 2302, Subtitle C of the Marine Plastic Pollution Research and Control Act of 1987, Title II of the United States-Japan Fishery Agreement Approval Act of 1987, PL 100-220, at 10.

[23] EPA's National Control Strategy for Combined Sewer Overflows restates this principle clearly. CSO Strategy at 2.

We strongly support enactment of legislation that mandates the elimination of CSO discharges by a date certain, and requires EPA to promulgate regulations setting out the means for eliminating such discharges. Both bills contain provisions designed to address this problem.

It is important that marine CSO elimination legislation establish timetables for action that require elimination of untreated discharges as expeditiously as possible.[24] The assessment, control strategy and implementation timetable of the 1987 toxic hotspot provision, now section 304(l) of the Clean Water Act, calls for full implementation of control strategies within 5 years from the date of enactment. We urge a similar timetable for marine CSO elimination.[25]

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[24] Of course, both bills make clear that existing requirements for the permitting of CSOs would remain in effect. This would mean that any unpermitted CSO discharge remains subject to permitting and enforcement actions at all times. (In this respect the approach of the proposed legislation differs from sec. 402(p) of the Clean Water Act, and we strongly support retaining the distinction.)

[25] S. 1178 calls for an implementation and CSO elimination schedule of 5 to 7 years; S. 1179 calls for full implementation of CSO controls within 7 years.

D. All Coastal Sewage Discharges Should Receive at Least Secondary Treatment

The proposals to increase controls on discharges to degraded waters and to reduce stormwater and CSO pollution stem from a recognition that our coastal and marine waters cannot, as some once believed, serve as a dumping ground for society's wastes. In light of the current state of knowledge and concern over cumulative stresses on marine water quality, it is appropriate to reconsider the validity of the 301(h) waiver, under which municipalities can obtain a waiver from the secondary treatment requirements of section 301(b) and discharge sewage wastewater that receives only primary level treatment.[28] This loophole runs directly counter to the goals of the legislation this Committee is considering today. The time has come to phase out the waiver, and to require that all coastal POTW discharges achieve secondary treatment levels.

First, the 301(h) waiver is grounded in the outmoded concept that the ocean can assimilate sewage without suffering ill effects. But evidence is growing that the cumulative effects of the discharge of inadequately treated sewage, taken together with the many other stresses placed on marine waters, is taking its toll. As the OTA Report correctly frames the issue:

> From a policy perspective, prohibiting [301(h)] waivers in the future could be justified because of the overall extent of pollutant inputs from many sources into

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[28] There are 48 facilities with approved 301(h) waivers; another nine have received tentative approval. (Figures supplied by EPA to NRDC, as of February 9, 1989.)

> estuaries and coastal waters and the expected trend of degradation in many of these waters.[27]

Second, we need to be deeply concerned about the toxic content of sewage treatment plant effluent which has not been given secondary treatment. Even though section 301(h) requires that pretreatment program requirements be met by industrial dischargers to the POTW which has a secondary treatment waiver, pretreatment standards generally are set based on an assumption that the industrial wastewaters will go on to receive secondary treatment at a well-operated POTW. Hence, even where all applicable pretreatment requirements are met by the industrial dischargers -- and evidence suggests that in many cases, pretreatment requirements are not met, but are flouted with impunity[28] -- the 301(h) secondary treatment waiver may pose a significant toxics threat to receiving ocean waters.

In sum, we urge the enactment of language that would phase out the availability of 301(h) waivers for all POTWs. At a minimum, additional controls on toxic discharges to POTWs without secondary treatment, such as a requirement that industrial dischargers to such plants meet Best Available Technology effluent limits rather than Pretreatment limits, should be considered.

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[27] OTA Report, supra, at 232.

[28] A recent General Accounting Office study found major deficiencies in the implementation of the pretreatment program, particularly in the area of enforcement of existing standards. See "Improved Monitoring and Enforcement Needed for Toxic Pollutants Entering Sewers," GAO/RCED-89-101 (April, 1989). For a more complete discussion of this issue, see "Testimony of the Natural Resources Defense Council, Inc. before the Subcommittee on Environmental Protection of the Senate Committee on Environment and Public Works" (hereafter NRDC CWA Testimony), June 16, 1989, at 9-13.

II. Controls on Poison Runoff

NRDC supports the provisions in S. 1178 and S. 1179 aimed at increased control of poison runoff, or nonpoint source pollution. Some of these provisions are consistent with the recommendations of a major new book that NRDC will release publicly tomorrow: Poison Runoff -- A Guide to State and Local Control of Nonpoint Source Water Pollution.

Building on the poison runoff control program contained in the 1987 Clean Water Act amendments,[29] S. 1178 would require that EPA develop a nonpoint source assessment and/or management plan for any designated-degraded watershed if the relevant state fails to develop an approvable one. Similarly, building on the concept of the National Estuary Program's management strategy approach,[30] S. 1179 would require that EPA develop and implement an individual management strategy (including a poison runoff control program) for each designated marine area in need of protection, if a state fails to submit and implement an approvable plan.

We believe that the promise of federal action (both the requirement to develop and the requirement to implement federal plans) in the event of state inaction would be a valuable spur to the states, and we support requiring that EPA both develop and implement poison runoff control plans, on a watershed-wide basis, for designated-degraded or threatened areas in cases where the state fails to act.

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[29] Section 316 of the 1987 Water Quality Act created Clean Water Act sec. 319, "Management of Nonpoint Sources of Pollution."

[30] Section 317 of the 1987 Water Quality Act created Clean Water Act sec. 320, the "National Estuary Program."

We also strongly support the proposal in S. 1179 that formally links the goals of the Conservation Reserve Program to the Clean Water Act's water quality and coastal protection goals. It is entirely appropriate that limited tax dollars in the CRP be targeted to further water quality protection goals. We support the creation of a statutory mechanism whereby the Secretary of Agriculture will work directly with the EPA Administrator to ensure that Conservation Reserve Program funds will be administered to advance poison runoff control objectives, including those cases where the benefits realized are not purely in the form of erosion control.

However, we are not satisfied that these proposals, although laudatory, will go far enough in addressing the gravity of the poison runoff threat to our coastal waters.

While the figures are familiar, they bear repeating. In the most recent national water quality survey completed under section 305(b) of the Clean Water Act, poison runoff accounted for sixty-five percent of the stream miles for which the states reported impairments,[31] and forty-five percent of the impairments in estuarine waters.[32] The OTA Report notes that, in the Chesapeake Bay, between 60 and 80 percent of the nitrogen that contributes to the Bay's eutrophication comes from nonpoint sources.[33]

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[31] National Water Quality Inventory; 1986 Report to Congress, EPA-440/4-87-008 (November 1987) at 20.

The extent of the problem is exhibited starkly in the results of the assessments conducted by the states under the "toxic hotspot" provision of the 1987 amendments, which required that each state submit inventories or lists of their impaired waters to EPA.[34] The States and EPA identified over 17,000 hot spots (areas where water quality does not meet applicable water quality standards or the "fishable and swimmable" goals of the Act). At only 595 of those contaminated sites -- less than 5% -- did the states attribute the problem entirely or substantially to individual point source discharges of priority pollutants.[35]

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[32] *Id.* at 43.

[33] OTA Report, *supra*, at 75.

[34] Section 308(a) of the Water Quality Act created Clean Water Act sec. 304(l), pursuant to which the states were to submit to EPA lists of waters that could not be anticipated to meet water quality standards or the law's "fishable/swimmable" goals due to the presence of toxic or other pollutants. Section 304(l) called for the development of three separate lists, the most comprehensive of which includes water bodies that are impaired due to both point and nonpoint discharges of toxic, conventional and nonconventional pollutants. *See* CWA sec. 304(l)(1)(A)(ii).

[35] EPA has taken the position that individual control strategies aimed at cleaning up these impaired waters need be developed and implemented only for the 595 waters on the states' "short" toxic hotspot lists, where problems are due entirely or substantially to point source discharges of priority pollutants. NRDC has challenged EPA's narrow interpretation of the law. *Natural Resources Defense Council, Inc. v. U.S. Environmental Protection Agency*, No. 89-70135 (Ninth circuit, filed March 23, 1989).

For a more complete discussion of this issue, *see* NRDC CWA Testimony at pages 20-23.

It is clear that poison runoff remains a critical problem in coastal areas and, indeed, throughout U.S. waters; undoubtedly, this is due in part to the fact that EPA and the states have focused largely on the control of point sources of pollution over the past fifteen years.

The enactment in 1987 of section 319 signalled a new era in recognizing the significance of contaminated runoff. Unfortunately, the level of action in controlling poison runoff remains distressingly low. State implementation of the poison runoff assessment and management mandate of section 319 has been very poor. EPA has approved only twenty state assessments of their nonpoint source pollution problems. Only nine state nonpoint source management programs -- the cornerstones of the program -- had been either fully or partially approved by the agency as of mid-June of this year.[36]

This lackluster performance can be attributed in part to a lack of funding for the 319 program,[37] and in part to the lack of a provision in section 319 that requires federal action if the states fail to move. This latter problem would be addressed by a combination of the two proposals before this Committee, which we support. However, we believe that further strengthening of the legislative mandate to control poison runoff also would help to move this program out of the starting gate. Experience has shown that a more prescriptive approach than the one now mandated by section 319 will have to be taken if progress in combatting coastal poison runoff is to move ahead quickly.

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[36] "Summary of State Progress in Meeting the Requirements of Section 319 of the Water Quality Act [sic] (6/10/89)", prepared by EPA.

[37] Although $400,000,000 were authorized for the program, no money was appropriated in either FY 88 or FY 89. EPA has requested a small increase in section 106 program monies to fund section 319 for FY 90, but the amount requested is minimal.

It should be said that there is, at this time, no shortage of creative ideas and approaches for addressing poison runoff. In fact, certain states and localities around the country have developed effective programs to combat the problem despite the lack of effective leadership from above. What we lack as a nation is a commitment of resources and effort to combat the problem.

NRDC's new guidebook, Poison Runoff: A Guide to State and Local Control of Nonpoint Source Water Pollution, makes specific recommendations as to how best a program can be structured. Among the key recommendations of Poison Runoff is that programs to control poison runoff must be geared towards compliance with water quality standards, and must be based on the link between land use and water quality.

Because of our research in drafting this book, we have concluded that there is an urgent need for legislation that draws a formal, mandatory link between water quality impacts and land use activities in the coastal zone. We strongly urge this Committee to consider such an approach.

The Clean Water Act's 401 certification procedure provides a useful model for the approach we support. Under section 401, any applicant for a federal license or permit who wishes to pursue activities that may result in any point or nonpoint source discharge to navigable waters must obtain from the state a certification that the discharge will comply with, among other things, state water quality standards. The 401 certification program compels the state to consider the water quality impacts of federally-permitted activities.

One logical means for injecting the same compulsory consideration of water quality impacts into the coastal development process would be to require that the state water quality agency certify to the state or local agency issuing a permit for any major development or activity that could result in a discharge to coastal waters, that the development or activity will not violate or contribute to the violation of state water quality standards within the coastal zone. Under this type of approach, the State's water quality management agency would retain -- and be required to exercise -- its expertise and authority to ensure that development in the coastal zone was undertaken only if water quality could be protected.

We recommend that this 401 certification approach be developed in a manner that requires consideration of cumulative water quality impacts due to incremental development in the area of the coastal zone. A mandate to look ahead and consider the cumulative effects of reasonably foreseeable development, along with existing development, would be a major spur towards comprehensive water quality management and planning.

The proposal in S. 1178 to require state 401 certification for federal flood insurance applicants certainly is consistent with this approach, and we support it.[38] But we would like to see the certification concept expanded to cover all major land use activities in the coastal zone, and not just those projects that apply for federal flood insurance.

III. National Water, Sediment and Wildlife Quality Standards

Water quality criteria are central to the Clean Water Act's monitoring, protection and regulatory scheme. First, criteria define for the public, the regulators and the regulated community what levels of water quality will protect human health and the aquatic environment. It is through the process of establishing water quality criteria that citizens can have their say about the level of water quality they want in their rivers, lakes and coastal waters. Second, criteria are the benchmarks against which water quality-based permits must be measured. Third, water quality criteria are essential to the effective and systematic assessment of state water quality status and trends.

For years, as Congress recognized in enacting the 1987 CWA amendments, many states had lagged behind in adopting numerical water quality criteria for toxic pollutants. They relied on their narrative standards prohibiting the presence of toxic substances in toxic amounts. The lack of numerical criteria was an obstacle to NPDES permitting, and discouraged states from monitoring for pollutants for which no criteria had been adopted. As Senator Chafee put the issue during floor debate on the amendments,

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[38] Sec. 103 of S. 1178 would require that any applicant for federal flood insurance for an activity that would result in a discharge of pollutants or pollution, obtain 401 certification that the activity would not violate water quality standards or section 319 of the Clean Water Act.

> Narrative criteria, implemented through biomonitoring, may be successful in expeditiously identifying and limiting toxic discharges on a broad scale.... However, in developing toxic criteria EPA and the States cannot exclusively depend on narrative criteria [i.e., "no toxic in toxic amounts"] as the primary means to combat toxic hazards."[39]

Since enactment in 1987 of the requirement that each state adopt numerical criteria for each priority toxic pollutant for which EPA has published a criteria document and that could reasonably be anticipated to be found in the state's waters, significant improvements in state water quality standards have begun to be made.[40] But progress should not stop here. There remain significant gaps in the criteria developed thus far by EPA, as well as in the individual states' criteria.

We support provisions in S. 1178 and S. 1179 aimed at improving water quality criteria and standards. First, we agree that there is a clear need for sediment quality and biological criteria to help define and protect the health of aquatic ecosystems. Indeed, sec. 304(a)(8) already places EPA under a mandatory duty to develop biomonitoring and assessment criteria.[41] EPA has been struggling with the development of such criteria for some time, and a legislative mandate to move forward would help to ensure that adequate EPA resources are devoted to the effort.

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[39] 131 Cong. Rec. S8005 (remarks of Sen. Chafee on S. 1128) (daily ed. June 12, 1895).

[40] For a more comprehensive discussion of the status of state adoption of numerical water quality criteria for toxics, see NRDC CWA Testimony at 23-25.

Second, it makes sense that consistent, scientifically sound standards be set for coastal waters that are by nature multi-state waters. Particularly when toxic and persistent bioaccumulative pollutants are in issue, we need a national standard that protects the public and aquatic ecosystems. It makes no sense that a perch caught off the coast of Maine could hypothetically subject the person who eats it to a one hundred-fold greater cancer risk due to toxic contamination, than a perch caught off the coast of New Jersey. Yet, that is what the present water quality standard-setting approach allows. All citizens are entitled to a consistent, adequate minimum level of protection;[42] national water quality standards for coastal waters would give us such protection. Hence, we support the provision in S. 1178 that calls for the Administrator to promulgate numerical water and sediment quality standards for all coastal waters.

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[41] Section 308(c) of the 1987 Water Quality Act created sec. 304(a)(8) of the Clean Water Act, under which EPA was to publish biomonitoring and assessment criteria within two years of the date of enactment.

[42] A state would be free to adopt a more protective standard under S. 1178, as is the case under current law. Moreover, site-specific standards also would be allowed so long as they were based on scientific evidence that a different standard was appropriate.

Finally, experience has shown that neither numerical criteria nor narrative criteria alone are sufficient tools for protecting water quality.[43] Numerical criteria for specific chemicals are advantageous for addressing carcinogens or bioaccumulative pollutants that must be directly limited, and provide important standards against which to measure stream health and set specific permit limits. On the other hand, whole effluent or biomonitoring criteria can more effectively address aggregate toxicity of a variety of pollutants that may be present in a discharge, and better account for the effects of chemical interactions among pollutants. Hence, EPA needs to be pressed to continue to pursue development of both numerical criteria documents for individual pollutants of concern, and living resource or biomonitoring criteria, as well.

Conclusion

Coastal pollution comes from many sources, all of which must be controlled effectively if we are to restore the health of our coastal waters. Most particularly, we must increase our attention to those diffuse sources that have escaped effective controls in the past. The proposed legislation takes a number of important steps in that direction, and we look forward to working with the Committee in strengthening the proposals still further.

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[43] For a discussion of the relative advantages and disadvantages of the pollutant-specific and the whole effluent approach to controlling toxic discharges, see "Technical Support Document for Water Quality-Based Toxics Control," EPA-440/4-85-032 (September 1985) at 2.

Testimony to the Senate Subcommittee on Superfund, Ocean and Water Protection and the Subcommittee on Environmental Protection (C.A.Karp, Narragansett Bay Project)

I have been asked to comment on the magnitude and extent of coastal pollution in Narragansett Bay, and on the effect that the Congressional 'Coastal Pollution Agenda' might have on Rhode Island's ability to protect Narragansett Bay water quality and natural resources.

In many respects, Narragansett Bay is the 'Everyman' of American estuaries. Major urban and industrial centers are spread along the rivers tributary to the Bay and are, like the city of Providence, concentrated at their confluence. As the cities flourished, the population sprawled along the neighboring coastline, inevitably followed by highways, sewage treatment plants and businesses. This history and pattern of development, which is typical of the entire northeast if not the entire country, has produced a legacy of fouled water, contaminated sediment, diminished fisheries and wildlife habitat, and an uncertain future.

Narragansett Bay, like many of the northeast estuaries, has lost most of its anadromous fisheries because of upstream fresh water impoundments and diversions, overfishing and pollution. Although the Bay still supports a major native shellfishing industry (revenues estimated at $17 million per year), several species are no longer commercially harvested and approximately 30% of the Bay is permanently closed to shellfishing due to sewage and combined sewer overflow (CSO) pollution. The urban waterfront, although in the process of being reclaimed, is still largely a wasteland that receives direct sanitary, industrial and thermal discharges, not to mention untreated sanitary waste and urban runoff from combined sewers. The coast remote from urban areas is increasingly characterized by a proliferation of marinas and residential development, accompanied by loss of public access and dirty beaches. Although serious water quality impacts are largely confined to the coastal waters immediately adjacent to the sources of chronic pollutant inputs, Rhode Island's offshore waters are not immune from major pollutant releases as last summer's plague of medical debris and the 'World Prodigy' oil spill of June 23rd have amply illustrated.

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Progress has been made in spite of this picture. On the one hand, because of Rhode Island's population density and distribution, its history of industrial development and environmental activism, and the Bay's physiography, Narragansett Bay simply does not have the same magnitude of water quality problems as other coastal areas. On the other hand, data compiled from various sources suggest that programs initiated pursuant to the Clean Water Act such as mandatory secondary sewage treatment and the industrial pretreatment program, the phase-out of leaded gasoline and the prohibition on the domestic manufacture of PCBs have, in fact, measurably reduced the pollutant burden on Narragansett Bay. Regulatory controls on development in tidal and nontidal wetlands appear to have impeded the wholesale loss of these valuable wildlife and nursery habitats. Recent State initiatives such as the acquisition of open space, mandatory recycling and hazardous waste reduction programs are expected to further reduce pollutant inputs.

In summary, Narragansett Bay may symbolize two important propositions in the field of water quality protection. First, it is possible to reclaim a seriously degraded body of water, as evidenced in the Providence River following the collapse of the City of Providence sewage treatment facility and the subsequent establishment of a regional sewage treatment authority in the early 1980s. Second, it virtually always takes a crisis of this nature to 'create' the political will (and the necessary commitment of funds) to address the problem.

Since Narragansett Bay suffers from persistent, but diverse, sources of pollution rather than from a single identifiable source, those entities responsible for managing Narragansett Bay are in the precarious position of trying to persuade the Rhode Island public that vast outlays of capital, and fundamental changes in land management practices and social behavior (regarding the generation, treatment and disposal of waste) are required merely to maintain present water quality achievements. To emphasize the point, a consultant hired to help design Rhode Island's State Revolving Fund, recently estimated that the State will need between $800 million and $1.5 billion over the next twenty years merely to finance capital construction costs for existing publicly owned treatment works (POTWs) to keep them operating at presently required levels of treatment. The State presently has $135 million in authorized wastewater bonds, and plans to sell an additional $80 million in the next five years, leaving close to a $600 million shortfall. These estimated costs probably do not reflect the real cost of CSO treatment/elimination, treatment/disposal of contaminated marine sediments or nonpoint source controls and retrofits.

In conclusion, Rhode Island, like many other coastal states, will require substantial outlays of money simply to maintain present levels of wastewater treatment using conventional treatment technologies. In order for shellfish beds to be re-opened, new sewage disinfection practices, CSO elimination, sewer extensions, limits on coastal development and general nonpoint source controls may also be required. A virtual revolution in land management philosophy and practice will be required to protect remaining wildlife habitat and indigenous marine and marine-dependent species. Given the costs associated with protecting coastal waters, the following questions should be addressed regarding the appropriate balance between environmental protection and use of marine and estuarine waters:

- Are marine and estuarine waters to be protected because they represent part of the 'public trust', a resource to be protected for the benefit of the entire nation? Or, should coastal waters be "reclaimed" in order to preserve existing uses?

- If the coastal waters and natural marine resources are considered to be part of the 'public trust', should the public pay for their restoration and protection? Or, should the users/polluters pay for the privilege and license to impair public use of public waters? If the purpose of restoration is to preserve established uses of coastal waters, should the public pay at all?

- How clean is clean? Should the nation's coastal waters be clean enough to support healthy shellfish populations, or clean enough for shellfish harvesting, or merely clean enough not to offend?

The House and Senate bills included as part of the Congressional "Coastal Protection Agenda" have attempted to address all these issues, but from slightly different points of view. My evaluation of Senate bills 1178,1179 and 587 and Representative Studds' bill (HR-2647) is presented on the following pages. I have attempted to review these bills in terms of their potential effect on the Narragansett Bay Project's ability to draft and, Rhode Island's ability to implement, a "Comprehensive Conservation and Management Plan" for Narragansett Bay. I have also commented on the national policy implications of the proposed legislation, where appropriate, and suggested additional measures that would, in my opinion, assist the coastal states in the colossal task of protecting and reclaiming the nation's coastal waters.

S.1178 (Senator Mitchell's proposed "Marine Protection Act of 1989")

S.1178 would 1) expand the National Estuary Program model as the means to producing comprehensive management plans for coastal and estuarine waters; and 2) require EPA to:

- a) monitor implementation of the management plans;
- b) completely prohibit sewage discharge from vessels in designated estuaries;
- c) develop guidance for marine CSO elimination;
- d) promulgate numerical marine water and sediment standards;
- e) assume (some) regulatory jurisdiction over designation of dredged material disposal sites, and develop criteria and best management practices to govern dredged material disposal;
- f) assess environmental effects of atmospheric deposition;
- g) identify presently unregulated pollutants in the coastal zone;
- h) investigate the possible use of microorganisms to biologically treat organic and chemical pollutants; and
- i) report to Congress biennially on the state of the nation's coastal waters.

Some of the particularly strong elements of S.1178 include:

- creating an incentive to achieve pollution prevention/reduction by a combination of requiring sworn affidavits at the request of the governing authority, and penalties for failure to comply;
- requiring EPA to assess compliance with the comprehensive management plan;
- requiring a biennial report to Congress on the state of the nation's waters and progress in 'reclaiming' coastal waters;
- creating an Estuarine Protection Fund via penalties;
- requiring EPA to address infiltration/inflow and water conservation in developing guidance for the elimination or control of CSOs;
- investigation of the impact of atmospheric deposition; and
- investigation into alternative treatment options such as microbial degradation of organic and chemical pollutants.

S.1178 would modify and greatly expand the National Estuary Program (NEP) and use it as a vehicle for accomplishing federal water quality objectives for coastal and estuarine waters. The most significant proposed modifications to the existing NEP are 1) data synthesis would be a prerequisite for eligibility; 2) some degree of (indirect) regulatory authority would be conferred upon the 'Management Conferences'; and 3) EPA would be ultimately responsible for implementation rather than the state(s) themselves. My comments regarding this approach are as follows:

1) Assuming that the NEP is the most appropriate vehicle for achieving reclamation of coastal and estuarine waters, my view is that data synthesis is an appropriate prerequisite for admission to the program and should be instituted immediately with respect to all nominated programs which have not yet been designated or funded. The criteria for designation once the available data are analyzed pose a philosophical problem however -- namely, should the NEP focus its attention on reclaiming degraded waters or protecting those coastal areas that do not show evidence of degradation? In principle, it seems easier and more cost-effective to protect undamaged water, living marine resources and habitat than to reverse the effects of chronic pollutant input. S.1178 provides a reasonable mechanism for addressing degraded marine waters that qualify for inclusion into the NEP. It is less effective at providing a new theory or approach for protecting non-degraded marine or coastal waters that are not 'designated' under the NEP.

2) Assuming that the Narragansett Bay Project (NBP) is a reasonable example of how the NEP was originally designed to function, I would argue that its ultimate success in producing and implementing a comprehensive management plan depends upon its "neutrality". The NBP's status as a research and planning program has ennabled it to attract broad participation from industry, local government, "user" groups and the regulatory agencies. This level of collaboration (and hopefully consensus) regarding objectives and implementation would be unlikely to exist if the Management Committee were armed with quasi-regulatory powers, e.g., the authority to compel affidavits regarding a dischargers' progress toward pollution prevention or reduction.

3) My view regarding the use of the EPA to oversee and supervise implementation of the management plans is mixed. On the one hand, it would be convenient to have a single regulatory authority empowered to compel implementation of the recommended corrective actions. On the other hand, the most important attributes of the existing NEP are a) that the primary incentive for implementation is the State(s)' sense that they have a vested interest in the outcome, and b) that the Bays Projects have been able to involve many federal and state agencies, as well as non-governmental institutions, in the process of drafting and, hopefully, executing the management plans. S.1178 compensates for the loss of these unique features of the NEP by 'guaranteeing' a 75% federal cost-share toward implementation. The federal committment of funds would, of course, be welcome and probably ought to be considered whether EPA has the primary responsibility for supervising implementation or not. [Note: The EPA-NOAA Memorandum of Understanding, in my view, represents an ad hoc effort to 'federalize' responsibility for overseeing implementation. As such,

the agreement could either be interpreted as evidence for designating a single agency to supervise implementation, or that the Bays Projects are in a better position to 'allocate' responsibilities among the implementing auhtorities based on local institutional arrangements and strengths.]

In summary, my general view is that the NEP, as exemplified by the Narragansett Bay Project, is a fine experiment in managing a waterbody with complicated water quality or natural resource problems. The Bays Projects are, however, labor intensive and not well-suited to address or solve the nation's shared marine water quality problems. The "shared" problems that I believe the federal government can solve more easily than the states or the NEP include imposition of nonpoint source controls that apply to all federally supported activities (e.g., USDA; Department of Transportation; BLM activities etc.); development of national policy and regulations that promote water conservation, address out of basin freshwater diversions and impoundments and promote more environmentally protective agricultural practices; development of criteria for dredged material disposal and designation of regional dredged material disposal sites; imposing requirements on boat manufacturers to install marine sanitation devices; promoting research and development into alternative sewage/septage pre-treatment, treatment and disposal practices; focussing more attention on habitat protection and protection of non-game marine species; creating a dedicated trust fund to help finance protection/reclamation of coastal waters, funded either with penalties or in the same manner as the savings and loan bail-out fund.

S.1179 (Senator Lautenberg's proposed amendments to the Federal Water Pollution Control Act and the Marine Protection, Research, and Sanctuaries Act, titled "Comprhensive Ocean Assessment and Strategy (Coast) Act of 1989")

S.1179 establishes 1) a process for identifying marine areas that are "in need of protection" and a process for focussing federal and state attention on those areas; 2) procedures (and schedules) for developing marine water, sediment and biological criteria by which to gauge whether marine areas need protection, and/or to gauge whether marine areas, in fact, meet the federal/state standards that are also to be developed; 3) procedures and schedule(s) for abating or eliminating marine CSOs, storm water runoff, agricultural runoff and toxic discharges to marine waters ; and 4) a formal review of federal activities that (potentially) degrade marine areas. S.1179 also mandates several major studies related to managing marine waters.

From the Narragansett Bay Project's perspective, this bill significantly strengthens the federal Water Pollution Control Act and (could) significantly assist state efforts to "reclaim" marine and estuarine waters. The following elements of S.1179 are particularly important:

1) The criteria for designation as a "marine area in need of protection" are appropriate and represent a good use of existing information. I would only note that, unless the states' 305(b) reports address nonpoint source inputs, the emphasis on toxics may preclude otherwise eligible marine areas. The bill seems overly ambitious in stating an eighteen month requirement for completing a "management strategy" and three years for implementation given the resources available to most states. What is the incentive for the state to write the "management strategy" where EPA would be required to write the plan by default?

2) The requirement that marine water, sediment and living marine resource criteria be developed is long overdue and an area that is beyond the ability of most states to address without federal guidance. It is not clear, however, whether 'living marine resource' criteria refers to criteria for gauging the health of marine organisms, criteria for gauging human health risk, or biological criteria for gauging water/sediment quality. Although guidance in all three areas would be helpful, federal standards that account for the health risk associated with human consumption of seafood are urgently needed from a public health perspective. In Narragansett Bay, for example, controlling sewage contamination of shellfish beds is a tractable problem compared to deciding whether shellfish with elevated tissue burdens of metals and organic contaminants should be harvested.

3) Federal pressure is necessary to eliminate marine CSOs and to regulate agricultural and stormwater runoff and is appropriately emphasized in S.1179. I have several (minor) concerns however. First, I do not believe that storm sewer separation is desirable, although the permitting requirements stated in Section 12 of the bill may make this option ultimately unattractive to the permittees. In Narragansett Bay, for example, >80% of the lead entering the Bay is estimated to come from stormwater runoff and other nonpoint sources including atmospheric deposition. Stormwater runoff is also a major pathway for introducing petroleum hydrocarbons, polycyclic aromatic hydrocarbons and cadmium to the Bay.
Second, it is not clear whether the proposed review of agricultural practices includes the use of fertilizers, pesticides, herbicides; erosion control; irrigation practices and water use in general. Also, in Rhode Island's case, the Soil Conservation Service may be a better source of data re. environmental effects of agricultural practices than EPA.
Third, I strongly believe that all permitted dischargers should be required to monitor their effluent/ discharge and the receiving water. Mandatory 'local effects' monitoring would (hopefully) create a different ethic about waste generation, reduction and disposal; establish a causal link between discharge and environmental effects; and permit the state agencies to monitor ecosystem health rather than focussing on impacts of some discharges. I also believe that five years to establish monitoring requirements is unnecessarily generous.

4) All of the proposed studies (atmospheric deposition, floatables, human health risk assessment, economic assessment of losses attributable to degradation of marine waters, and relationship between algal blooms and nutrient enrichment) are necessary and important. As stated above, the states could use federal standards re. shellfish tissue burdens of metals and organic contaminants.

5) The proposed review of the impact of federal agency activities on marine waters is extremely important. For example, it would be a major contribution if the use of federal highway funds was conditioned on the use of best management practices to control highway runoff. Related provisions should include a) requirements that highways be 'retrofitted' to control runoff where federal funds are used for repair; b) penalties for contractors and/or the state where construction does not meet design specifications; and c) a requirement that the entire project be subject to environmental review at one time rather than being reviewed in phases.

6) The Marine Environment Information Center is a great idea. Oceanographic data that are routinely collected by EPA (through the NPDES program, NEP, Coastal Waters Inititive etc.), Department of Defense, Bureau

of Land Management (MMS), NOAA (NMFS, Sea Grant etc.), National Weather Service should be explicitly included in the data synthesis.

7) Sections 6 and 11 of S.1179 (Marine Environment Toxics Release Inventory Assessment and Strategy; Industrial Pretreatment) are extremely important but would perhaps be more effective if coupled with direct incentives for private sector research into waste reducing technologies.

S.587 (Senator Mitchell's proposed amendments to the Marine Protection, Research, and Sanctuaries Act)

S.587 would establish ten (10) regional marine research institutions that would be charged with 1) developing research programs to address marine and coastal environmental processes and problems; 2) monitoring and assessing the effect of marine and coastal activities on environmental and public health; and 3) advising the relevant governmental entities on appropriate corrective or protective actions.

The strengths of the proposed amendment include:

- establishment of permanent institutions dedicated to marine and coastal monitoring and research;
- identified source of funding that can be applied to development, operation and maintenence of oceanographic sampling equipment and technology;
- emphasis on annual reporting of environmental trends, and effects of marine and coastal activities on the environment.

In my view, the major flaw in the proposed amendment is its failure to take advantage of, or reconcile, existing (federal and state) programs that already perform many of the outlined responsibilities of the proposed marine research institutions. The proposed amendment is unclear as to whether the "redundancy" would be eliminated by eliminating existing programs or by re-defining the mandate of the existing programs.

For example, NSF has the mandate, and the bureaucracy in place, to finance basic research into marine bio-geochemical processes. NSF's problem, in recent years, has been the lack of money dedicated to basic oceanographic research and development of marine technology. Another example is those states that have coastal zone management plans approved under the CZMA. Rhode Island, for example, has a coastal zone management agency which has the mandate and the regulatory authority to review activities in the coastal zone in terms of their consistency with principles of water quality, habitat and resource protection. Its major problems are 1) it lacks the resources to comprehensively review marine and coastal activities in view of their cumulative impact on the environment; and 2) its institutional philospohy is primarily focused on accomodating mulitple uses of coastal waters rather than on preserving and protecting water quality and natural resources.

A third example of an existing program which already performs many of the functions of the proposed marine research institutes is EPA's National Estuary Program (NEP). The eight existing NEP programs (including the Chesapeake Bay and Great Lakes programs) have, for several years, been funding directed research into identifying marine and estuarine water quality and natural resource problems, identifying corrective actions and working with existing regulatory authorities to implement those corrective actions. Many of these programs are 'regional' in nature since the estuaries are shared by more than one political entity, although these programs are waterbody- specific. In the case of the Narragansett Bay Project, the major differences from the proposed model are that the Bay Project's focus is on a single geographically distinct waterbody, and that, because of resources, the Project has not funded the development of oceanographic sampling equipment.

In summary, from the Narragansett Bay Project's perspective, the infusion of resources into marine and estuarine research and monitoring is welcome. However, the proposed legislation fails to suggest how existing institutional arrangements can reconciled with the research, advisory and regulatory functions of the proposed regional institutes. For example, if Rhode Island's (informal) plan to institutionalize the Bay Project in some form materializes, there would potentially be a considerable overlap in function. I assume that this would also be true of other states with on-going estuary programs.

Given the variety of on-going near-coastal programs, the proposed regional marine research institutes would probably be most effective if their research focus was truly regional in scope, i.e., directed at large-scale oceanographic and climatologic problems such as sea level rise, atmospheric transport of pollutants, out of basin fresh water withdrawals etc.. One argument for this approach is that the environmental effects of direct pollutant discharges and other near-coastal activities tend to be expressed as 'local effects' as a first order problem. As a final matter, the proposed amendment should strongly emphasize the need to synthesize existing oceanographic data routinely collected under existing EPA, NOAA, ACOE, USGS, DOD, USFW, OCS and MMS programs.

H.____ (Representative Studd's proposed "Coastal Resources Protection Act of 1989")

There are several key elements of this bill that will hopefully find their way into the "Congressional Coastal Protection Agenda" . These provisions include:

1) Section 203 (b)(3 - 5). The system-wide waste load allocation of point and nonpoint source inputs is by far the best approach to solving marine water quality problems. The idea of "tradeable discharge credits" is one of the best features of Maryland's Critical Areas Program and should be institutionalized. This approach allows for measured growth while placing the burden on planners to offset increased point source discharge with nonpoint source reductions. [Note that Maryland has developed some simple formulae for calculating such offsets.]

2) Section 204. This is the only bill that directly provides for protection of 'outstanding resource waters' and recognizes unique ecological, habitat and aesthetic characteristics as important attributes of those waters.

3) Section 301. Again, this is the only bill that directly acknowledges the relationship between coastal land use and protection of marine and estuarine resources. It is extremely important that this principle be formally recognized and stated at the federal level because it will ultimately promote watershed-scale planning as opposed to facility-scale planning. In addition, the proposed amendments to the CZMA represent a conceptually important re-focussing of the CZM mission -- as a practical matter, many state CZM agencies have historically appeared to view their mission as coastal planning in order to achieve 'maximum sustainable yield' of coastal and marine resources in terms of human use, rather than protection of coastal water quality, living marine resources and habitat as equally important attributes of coastal systems.

4) In general, this bill seems to strike a good balance between the respective strengths of the water pollution control and coastal zone planning agencies. Hopefully, some provision can be made to assure adequate funding for both agencies where the programs are delegated to the states.

5) Section 401. The findings appropriately state the problem with the country's current approach to environmental monitoring. For reasons stated in another section of this review, I strongly believe that the burden of 'local effects' monitoring properly attaches to the discharger rather than to the regulatory agencies. In addition, the federal government should be careful

not to dismantle existing long-term monitoring programs such as LANDSAT and the National Weather Service weather stations. Interruption of these programs could destroy what is otherwise the best continuous baseline of general land use and climatological data that are available.

6) Section 403(d). Pressure from the federal government to standardize data management is long overdue. However, this effort, if it is eventually mandated, should not result in the dismantling of presently functional regional and/or local databases, nor should it require such regional and local databases to conform to the federal system without substantial federal financial support.
As a related aside, non-delegated water pollution control programs should begin to require dischargers to submit data in machine-readable format so that more attention can be paid to data analysis and synthesis than to data entry. Eventually, and sooner rather than later, delegated programs should also begin to require data submission in machine-readable format for exactly the same reasons.

7) Sections 501 - 507. The stated philospohy and approach to achieving compliance represents a vast improvement over present enforcement options, particularly with respect to a) conditioning continued federal contracts and federal financial assistance on compliance; b) requiring quarterly, independent environmental audits at non-complying facilities; and c) removing the economic benefit of noncompliance.

8) Section 508. Citizen suit jurisdiction should be extended to the CZMA.

9) Section 601 - 606. The 'Coastal Resources Protection Fund' is an important departure from current approaches to financing water pollution control and resource protection programs to the extent it requires resource users, dischargers and violators to capitalize the fund. The principles governing the administration and allocation of funds seem equitable but, possibly, difficult to implement.

APPENDICES

NARRAGANSETT BAY PROJECT

COMPREHENSIVE CONSERVATION AND MANGEMENT PLAN

STRUCTURE

The CCMP will consist of:

*I. The Management Plan itself:

- 100-250 pp
- short executive summary
- chapters devoted to comprehensive overview and recommendations for each identified problem area as well as chapters for key geographic or topical areas and recommendations to implementing authorities
- each chapter will have a two page executive summary ("Action Plan")

II. Supporting Technical Documents

- six on priority issues
    -toxics
    -pathogens
    -eutrophication/dissolved oxygen
    -fisheries managemnt (quahogs, winter flounder, general)
    -risk assessment
    -land based impacts on water quality
- document(s) on specific geographic or topical areas, e.g.
    - Blackstone River
    - Greenwich Bay
    - Wastewater treatment
    - CSOs
    - habitat loss
    - enforcement
    - long-term monitoring plan

III. Technical Reports

- reports on research funded by NBP
- other reports and data used in CCMP development

*An abbreviated version of the Mangement Plan will also be published. This "working document" will include an executive summary and the executive summaries ("Action Plans") from each chapter of the Management Plan.

Tentative schedule for production of "Comprehensive Conservation Management Plan" (CCMP)

1. Write detailed report that supports the appropriate chapter of the management plan. [See II of "structure of CCMP"].

Reports:

*(4) "Toxics" (or "Water Quality/Sediment Quality")
(2) Fecal Contaminants
(2) Eutrophication/Hypoxia
(4) Fisheries Management
(1) Risk Assessment
(3) Land-based Impacts on Water Quality
Miscellaneous: (1) Blackstone River
(1) Greenwich Bay
(1) Wastewater treatment
(1) CSOs
(1) habitat loss
(1) enforcement

TOTAL: 22 person months to complete writing of "special reports"

2. Formal peer and committee review of each report. TOTAL: assume 2 months per report to complete review process, including revisions.

3. Draft appropriate chapter of managment plan upon completion of the relevant report; "build" Chapter VII. "Recommendations to implementing authorities" TOTAL: 1 month maximum per chapter

4. Committee review, interest/user group review, public hearings

NOTE: Concurrent and continuing activites include cost/benefit analysis, assembling bibliography, "locating" funds for implementation

*estimated person months to complete

1985 RESEARCH PROJECTS

Brown, M., L. Kossin and H. Ward (Principal Investigator). **Narragansett Bay issue assessment: Public perceptions.** What does the public think about the condition of Narragansett Bay?

Cabelli, V.J. **Microbial indicator levels in the Providence River and Upper Narragansett Bay.** How polluted is Narragansett Bay? A study investigating the sources, loadings and transport of fecal indicators (indicators of human disease-causing pathogens from fecal wastes) in the Providence River area.

Cabelli, V.J. **Microbial indicator levels in shellfish, water and sediments from the Upper Narragansett Bay conditional shellfish-growing area.** Should other indicators of fecal contamination be used in addition to or instead of the standard coliform counts for monitoring shellfish areas? A study comparing several fecal indicators to the fecal coliform standard and their relevance to water and shellfish quality.

Kern, K.G. **Quahog histopathology studies.** How healthy are Narragansett Bay quahogs? A study evaluating the health (condition and presence of diseases) of quahogs from various sites in Narragansett Bay.

Kremer, J.N. **Improving an estuarine water quality ecosytem model for Narragansett Bay.** The development of a computerized ecosystem model that looks at the relationships between nutrients and dissolved oxygen, and the growth of Bay planktonic organisms.

Kumekawa, G., C. Giliberto, L. Carlson and G. Poirer. **Towards the management of Narragansett Bay: An institutional analysis.** Are Rhode Island's regulatory agencies meeting the goals of the public, Bay user groups and government agencies? A study looking at Narragansett Bay regulatory institutions.

Pilson, M.E.Q. and C.D. Hunt. **A summary of results from the SINBADD cruises 1985-1986.** How polluted is Narragansett Bay? A Bay-wide water quality study investigating the sources and distributions of nutrients and trace metals entering Narragansett Bay.

Pratt, S.D. **Status of hard clam fishery in Narragansett Bay.** How has the harvesting of quahogs changed in Rhode Island? A study examining the history and governance of the quahog fishery in Narragansett Bay.

Pratt, S.D., B.K. Martin and S.B. Saila (Principal Investigator). **Status of the hard clam (*Mercenaria mercenaria*) in the Providence River and Mt. Hope Bay.** Are quahogs present in closed fishery areas? A study investigating the status of quahogs from the closed fishery areas of the Providence River and Mt. Hope Bay.

Quinn, J.G., J.S. Latimer, C.G. Carey, J.T. Ellis and J. Zheng. **Development of a one dimensional water quality model for the Blackstone River; Part 1: Chemical monitoring of pollutants in the Blackstone River.** How do point source (municipal and industrial) inputs affect the Blackstone River's water quality? A study investigating the sources of toxic pollutants (trace metals and organic compounds) to the Blackstone River.

Smayda, T.J. Environmental conditions and plankton dynamics in Narragansett Bay during an annual cycle characterized by a brown-tide. What were the climatological and water quality conditions in Narragansett Bay during the "brown tide" algal bloom? A study examining Bay conditions the summer of 1985.

Thibault/Bubly Associates. Trace metals in quahogs from Narragansett Bay. How contaminated are Narragansett Bay quahogs? A Bay-wide study investigating the levels of trace metals in quahogs from Narragansett Bay.

Vandal, G.M and W.F. Fitzgerald. **(M.E.Q. Pilson - Principal Investigator) Mercury in the waters of Narragansett Bay.** How polluted is Narragansett Bay? A Bay-wide water quality study investigating the levels of mercury in the waters of Narragansett Bay based on samples collected during the SINBADD cruises.

Wright, R.M. Development of a one dimensional water quality model for the Blackstone River; Part 2: Mathematical modeling. The development of a water quality computer model to predict pollutant distributions in the Blackstone River.

1986 RESEARCH PROJECTS

Almeida, F.P. and M.P. Fogarty. **Assessing the effects of pollutant exposure on estuarine populations.** Do pollutants differentially affect larval, juvenile and adult winter flounder populations? The development of a life history model to estimate the impact of pollutants and fishing on winter flounder populations.

Brown, H.S., R. Goble and L. Teitelbaum. **Methodology for assessing hazards of contaminants in seafood.** What risks are Rhode Islanders taking by eating Narragansett Bay shellfish? The development of a method to estimate the levels of trace metals in quahog tissues that might cause adverse health effects in human consumers.

Buckley, L.J. and E.M. Caldarone. **Recent growth and biochemical composition of juvenile, young-of-year winter flounder from different areas of Narragansett Bay.** How healthy are young winter flounder populations in Narragansett Bay? A study examining juvenile winter flounder populations across a Bay-wide pollution gradient.

Deacutis, C. Bathing beach monitoring for new indicators. What are the bacterial levels in the waters at major Rhode Island beaches? A study comparing the fecal coliform standard to EPA's proposed indicator organism, *Enterococcus*.

Doering, P.H., C.A. Oviatt and **M.E.Q. Pilson (Principal Investigator). Monitoring of the Providence and Seekonk Rivers for trace metals and associated parameters.** How polluted is the Providence River area? A Providence River water quality study investigating the levels of trace metals in the Providence and Seekonk Rivers.

Doering, P.H., **M.E.Q. Pilson (Principal Investigator)** and C.A. Oviatt. **SPRAY cruise dissolved oxygen.** How polluted is the Providence River area? A study investigating the relationship between pollutants and dissolved oxygen in the Providence and Seekonk Rivers during the summer months.

Frithsen, J.B., D. Nacci, **C. Oviatt (Principal Investigator)**, C.J. Strobel and R. Walsh. **Using single-species and whole ecosystem tests to characterize the toxicity of a sewage treatment plant effluent.** How do experimental ecosystems respond to increasing doses of sewage? Are these responses predictable from simple laboratory bench tests conducted with the same sewage doses? A study comparing the toxic effects of a wastewater treatment facility effluent on a single species and on an experimental ecosystem.

Gold, A., and G.W. Loomis. **Phosphorus loadings to the groundwater from suburban land uses.** How efficient are Individual Sewage Disposal Systems (ISDS) at removing the phosphorus from household wastewater? A study examining the removal of phosphorus from conventional and experimental ISDS systems.

Jeffries, H.P, S. Hale and A. Keller. **Historical data assessment finfishes of the Narragansett Bay area: Report 88.** How do the historical trends of finfish populations in Narragansett Bay compare to the current status of these populations? (Two-year study 1986-1987.)

Ries, K. Estimation of surface-water runoff to Narragansett Bay, Rhode Island and Massachusetts. What are the seasonal flow rates of freshwater inputs to Narragansett Bay? A study evaluating the monthly averages of runoff into Narragansett Bay from its tributaries. (Two-year study 1986-1987.)

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Lee, T.C., **S.B. Saila (Principal Investigator)** and R.E. Wolke. **Winter flounder contaminant and pathological survey - Narragansett Bay and vicinity.** Is there a correlation between adult winter flounder health and water quality? A study examining changes in cell structure and the levels of toxic pollutants in winter flounder tissues.

Myers, J.C., J. Ehrenfeld (Principal Investigator) and M. Murray-Brown. **Governance of nonpoint pollution inputs to Narragansett Bay.** How does Rhode Island regulate nonpoint sources of pollution? A study that examines the instituional structure and regulatory programs of state agencies and recommends inprovements.

Nixon, S. Historical assessments of Narragansett Bay. Has the water quality of Narragansett Bay and the health of its living resources changed over time? A study evaluating Narragansett Bay historical data to examine trends in the levels of toxic pollutants, nutrients and plankton. (Two-year study 1986-1987.)

Pruell, R.J., C.B. Norwood, R.D. Bowen, R.E. Palmquist and S.J. Fluck. **Organic contaminants in quahogs, *Mercenaria mercenaria*, collected from Narragansett Bay.** How contaminated are Narragansett Bay quahogs? A Bay-wide study examining the levels of organic contaminants in Narragansett Bay quahogs.

Quinn, J.G., J.S. Latimer, J.T. Ellis, L.A. LeBlanc and J. Zheng. **Analyses of archived water samples for organic pollutants.** How polluted is Narragansett Bay? A Bay-wide study investigating the sources and levels of organic compounds in Narragansett Bay based on samples archived from the SINBADD crusises.

Rippey, S.R. and W.D. Watkins. **Mount Hope Bay sanitary survey - Microbiological 1986-1987.** Can Mount Hope Bay be reopened to shellfishing? A study examining the extent of fecal pollution in Mount Hope Bay.

Smayda, T.J. Survey of phytoplankton dynamics along a eutrophication gradient in Narragansett Bay. What is the distribution and productivity of the microscopic plants in Narragansett Bay? A study examining the productivity of the principal algal species in Narragansett Bay in relation to a gradient of nutrient enrichment.

Spaulding, M.J., F.M. White, P. Heinmiller, M.M. Simoneau, S.J. Liang and J.K. Choi. **Circulation Dynamics in Mount Hope Bay and the lower Taunton River.** How does freshwater from the Taunton River circulate in Mount Hope Bay? The development of a computer model to predict water movement between Mount Hope Bay, Narragansett Bay and the Sakonnet River.

Swanson, J.C. and K. Jayko. **A simplified estuarine box model of Narragansett Bay.** How do substances discharged into Narragansett Bay affect the water quality of surface and bottom waters? The development of a two-layer computer model for predicting pollutant distributions in Narragansett Bay.

West, N. Evaluation of shoreline recreational usage. A study evaluating the recreational uses of Upper Narragansett Bay.

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Brown, H.S., R. Goble and C.C. Mao. **Assessment of hazards of contaminants in seafood.** What risks are Rhode Islanders taking by eating Narragansett Bay shellfish? Use of a method, developed in 1986, for analysis of risks to human consumers from metals and organics in quahogs.

Buckley, L. Viability of the eggs and larvae of winter flounder from Narragansett Bay reared under controlled conditions. How do biological factors, natural environmental variability, and pollution affect production of winter flounder? A study of growth and survival of winter flounder from eggs and larvae spawned by adults from Narragansett Bay and Long Island Sound.

Durbin, A.G., G. Klein-MacPhee, and E. Durbin. **A study of growth, survival and food habits of winter flounder in Narragansett Bay, R.I.** What factors influence the abundance, growth and survival of winter flounder larvae in Narragansett Bay? A study examining the physiological state, age and growth rates, and food habits of winter flounder larvae. (Two-year study 1987-1988.)

Hargraves, P.E. Characterization of "brown tides", and other bloom-forming picoalgae and their interactive effects on phytoplankton. What alga caused the "brown tide" of 1985 in Narragansett Bay? A study of picoplankton-sized algae from Narragansett Bay, including isolation, cultivation, species identification, and examination of possible biological competitive, interactive effects *in vitro* among these algae. (Two-year study 1987-1988.)

King, J.W., J. Quinn, R. McMaster, S. Pratt. **A study of the sediments of Narragansett Bay.** How are contaminated sediments transported and deposited in Narragansett Bay? Do the rivers act as reservoirs for contaminated sediments? Continuation of a two year study on the history of pollution in Narragansett Bay as recorded in the sediments. (Two-year study 1987-1988.)

Sutinen, J.G. Regulatory compliance and enforcement: industrial wastewater pretreatment programs in R.I. How effective is enforcement of industrial pretreatment in R.I.? A study examining noncompliance patterns and the role enforcement plays in controlling noncompliance.

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Apogee Research, Inc. Inventory of funding sources for cleanup and maintenance of Narragansett Bay. How can we pay for a clean Bay? A study of available funding sources for cleaning up point source, CSO, and nonpoint source pollution.

Chang, P.W. Etiology of clam leukemia. What causes cancer in soft-shelled clams? An investigation of viruses versus organic pollutants as the main cause of neoplastic tumors in the soft-shelled clam, *Mya arenaria*.

Dettman, E.H. and F.A. Godshall. **Dissolved oxygen modeling in the Providence River, Narragansett Bay, R.I.** Will the pollutants we discharge to the Providence River cause low dissolved oxygen levels there? Running available water quality models to predict dissolved oxygen concentrations, given loadings of pollutants to the Providence River.

Germano, J. and D. Rhoads. **Narragansett Bay sediment quality survey, August 1988.** What do benthic communities look like at different sites in Narragansett Bay? In-situ camera survey at the sediment-water interface to measure redox potential and estimate biological activity.

Gold, A.J. and L.T. Thiem. **Design and evaluation of nitrogen removal systems for individual sewage disposal in coastal communities.** What kinds of individual sewage disposal systems (ISDS) remove nitrogen most efficiently? A study to monitor the removal of nitrogen in effluent from alternative and conventional ISDS under the field conditions found in coastal regions of Southern New England. The study may be used to recommend more effective ISDSs in non-sewered communities.

Huebert, B. Atmospheric deposition as a source of nitrate to Narragansett Bay. Is the atmosphere a significant source of nitrogen to Narragansett Bay? A study monitoring wet and dry deposition of nitrogen at sites in major watersheds that feed the Bay.

Keith, D.J. and **W.R. Davis. Transport and fate of sediments within Narragansett Bay.** What are the particle/pollutant transport pathways within the Narragansett Bay system? A study examining resuspension potential and relationships between sediment erodibility, grain size and water content.

Schimmel, S. The whole-effluent toxicity component of a wet weather study of the Providence River and upper Narragansett Bay. How do effluents affect the Bay biota? An effort to characterize the toxicity of wastewater treatment facility effluents, CSO discharges, and ambient waters in Narragansett Bay during dry and wet weather conditions.

Scott, J. and M. Redmond. **Sediment toxicity in Narragansett Bay.** How polluted are sediments in harbors and coves around the Bay? Use of acute toxicity tests to evaluate relative toxicity of sediments from embayments surrounding Narragansett Bay.

Wright, R., L.T. Thiem, J. Quinn, W. Watkins and S. Rippey. Problem assessment of wet weather discharges entering Narragansett Bay from tributaries and treatment plants receiving urban runoff and combined sewage. Where does pollution go when it rains? A study to characterize and assess the impact of wet weather discharges from tributaries and treatment plants in comparison to dry weather pollution sources entering the Providence River and upper Narragansett Bay.

ASWIPCA

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ASSOCIATION OF STATE AND INTERSTATE
WATER POLLUTION CONTROL ADMINISTRATORS

Testimony before the
Senate Subcommittees on Environment Protection and
Superfund, Ocean, and Water Protection

SUBJECT: PROTECTION OF MARINE ENVIRONMENTS

July 12, 1989

ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Testimony before the
Senate Subcommittees on Environment Protection and
Superfund, Ocean, and Water Protection

July 12, 1989

Mr. Chairman, Members of the Subcommittees:

My name is Linda Eichmiller, Deputy Director of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). ASIWPCA is the national non-partisan organization of State water professionals responsible for the implementation of this nation's water quality programs. The Association commends the Subcommittees for their strong support of State Clean Water Programs. The States are pleased to have this opportunity to discuss our views on protection of marine waters.

States share the Congressional concern on the need to protect oceans as well as other water resources from pollution. Members of the Subcommittees have been very thoughtful in the development of S. 587, 1178, and 1179.. The bills address many vital issues and:

.. Recognize the need to progress into new key areas such as acid rain and sediment standards.

.. Endeavor to rejuvenate critical ongoing activities related to oceans protection such as planning, integration of government activities at all levels, criteria development, standards setting, control of combined sewers and stormwater permitting.

In considering legislation, the States encourage the Subcommittees to:

1) **Recognize the value of the extensive ongoing efforts** to protect and enhance marine waters underway in the States -- often against formidable odds given the limited funds available and complex issues involved.

2) **Build on the institutions and activities already in-place** to promote further efforts without delay.

3) **Vigorously support full funding for water programs as the primary Federal responsibility** in the State/Federal partnership.

4) **Distinguish between situations** where 1) legislative authority exists to solve problems but is not adequately carried out -- i.e. where Congressional oversight is critically needed, and 2) inadequate authority exists -- i.e. where further legislative action is needed.

5) **Avoid reporting and unrealistic requirements or deadlines** that divert resources from ongoing comprehensive programs and fractionate the control of marine pollution under a plethora of separate programs or offices.

6) **Recognize marine pollution problems can be complex.** The answers are frequently not readily apparent, and remedies are time consuming and often protracted.

GENERAL COMMENTS ON S. 587, 1178, AND 1179

1) The CLEAN WATER ACT IS THE BEST VEHICLE for addressing marine problems.

2) MANY OF THE ACTIVITIES ARE OR SHOULD BE A PRIORITY NOW that are suggested in the bills. E.g. they need no further legislation and the States want to work with Congress and the USEPA to put them fully into place.

3) THE PROBLEM CONFRONTING THE STATES IS PRIMARILY FINANCIAL. No action the Committee can take to protect oceans is more important than to secure Federal funding support at least at the authorized levels.

    a) Federal funding is eroding. Section 106 is funded at 1972 levels considering inflation and termination of the Construction Grants setasides will cripple State programs unless further action is taken.

    b) $600 Million is required to implement the Clean Water Act using very conservative programs. This is approximately twice as much as currently provided. The 106 authorization would have to be doubled -- just to maintain a 25% Federal fair share.

    c) It is impossible to solve the marine pollution problems without tackling combined sewer overflows, nutrient removal and nonpoint sources.

        .. Federal support to municipal treatment is declining precipitously. State Revolving Loan funding must be increased to the fully authorized level to achieve objectives.

        .. Federal support to nonpoint sources is virtually nonexistent. Section 319 should be fully funded.

The use of State Revolving Loan Fund money to finance marine management programs is inappropriate. Increased funding should be provided under a more comprehensive program using Section 106.

d) Unfortunately, Federal, State, and Local resource constraints, in most instances, have eliminated the availability of new funding for environmental programs. We are concerned, therefore, that new legislation not exacerbate the situation by diverting increasingly scare resources from State management of the overall national water program.

4) THE MARINE ENVIRONMENT CAN BE PROTECTED ONLY WITH A STRONG BASIC WATER program. Emphasis on oceans should not detract from, but should be an integral part of, the focus and resources of ongoing programs to address all waters. States support expanded and enhanced:

- Research programs
- Health impacts studies
- Dredge spoil disposal programs
- Monitoring and technical exchange
- Algal bloom study
- Penalty programs

The Association questions the need, however, for initiatives for point source reviews, pretreatment, etc. separate from the base water program authority and we are concerned that the bills establish marine combined sewer overflow (CSO) program deadlines which are unrealistic and unachievable at the outset. When such unrealistic deadlines are imposed, we build public expectations only to fall short in program implementation.

5) USEPA HAS NEITHER THE INFORMATION NOR EXPERTISE TO ESTABLISH SOUND WATER QUALITY STANDARDS for this nation's many marine waters. And, due to many State laws prohibiting requirements more stringent than Federal standards as well as likely objections by the regulated community to such "upgrades", such a policy would deter environmental protection. States are currently required to establish water quality standards for coastal waters and assess whether water quality goals are being met. Standard setting should remain a State responsibility, with far more USEPA attention allocated to developing sediment and other marine criteria.

Except as related to public health protection and water-contact activities, numeric criteria are especially difficult to evaluate in marine waters because of natural chemical and physical conditions as well as in-place pollution. They also have limited usefulness in contrast with biologically based approaches.

6) STORMWATER PERMITTING REQUIREMENTS ARE JUST BEING IMPLEMENTED under the 1987 Water Quality Act. It is premature to amend those provisions at this time. In our judgement, any action to do so will only delay local implementation.

DISCUSSION

The bills before the Subcommittees appropriately add emphasis and direction to the Clean Water Act requirements for oceans protection. It must be recognized, however, that the ongoing water programs do not end at the coast. Water quality standards, effluent limits, toxics control, stormwater, nonpoint source programs and CSO programs all currently apply to coastal as well as fresh waters. These programs can be very effective in addressing marine problems.

Funding -- The biggest impediment to protecting and cleaning up coastal waters is the vast costs to implement comprehensive management plans. For example, as much as $6 Billion would be required just to clean up Long Island Sound. Focusing more resources on additional reports and inventories or altering existing permitting programs won't solve the problem and may, in fact, delay implementation.

Watersheds -- Oceans and bays receive the wastes from many rivers and land uses. Increasing reporting, monitoring, enforcement, standards development and control of pollution sources along an arbitrary coastal shoreline may not enhance water quality or improve living marine resources. Water quality management programs must comprehensively address inland and coastal waters as a whole.

For example, in Connecticut all freshwater streams drain to Long Island Sound. In fact, much of the waste from Massachusetts, Vermont and New Hampshire is drained by the Connecticut River, contributing more than two-thirds of the freshwater discharge to Long Island Sound and much of the pollution. Clearly, inland water quality management activities cannot be divorced from water quality strategies for the Sound. An unwarranted focus on specific direct discharges to coastal waters may, in fact, impede overall progress because of the inland relationship to coastal water quality.

New efforts are needed to control the collective impact of multiple sources of pollution to marine environments with models of waterbodies, wasteload allocations, nutrient removal and control of air and river sources. Comprehensive evaluations of larger water bodies are a logical step in the evolution of State water pollution control programs. Solutions will require new control measures directed at the problem sources which:

1) are not just water pollution or coastal sources, and
2) can be implemented under existing regulatory authorities.

Integration -- Comprehensive water programs that integrate all sources of pollution should be used to address the routine activities of nonpoint and point source control, enforcement and water quality standard development. **Funding for these efforts will be most effective if it is channeled through a central source such as Section 106 that integrates efforts into a common goal of general water pollution control. A coastal focus on review is appropriate but not as a separate or new program.**

This is not to imply that all problems have been resolved, only that answers need to be developed in current programs. Research initiatives in the areas of human health risk assessment, sediment criteria, fate and transport of contaminants, and estuarine modeling are needed to enhance present day water pollution control activities. Further education and public outreach programs are critical to helping the public understand the nature and the needs of these programs and to generate support for funding.

CSO's and Nonpoint Sources -- Floatable waste and bacterial contamination originate from both marine and inland CSO's and a wide variety of nonpoint source discharges. These sources of pollution are incorporated into State priorities for the construction grants/revolving loan program and nonpoint source strategies. Any effort to enhance marine water quality must:

1) vigorously address these sources with firm, but reasonable expectations in a cooperative fashion at the Federal, State, and local levels,

2) realistically mesh with ongoing programs to assure expeditious progress, and

3) provide additional funding to large and small communities.

S. 587 -- The Association supports the objectives of S. 587. Research and planning are fundamental to effective program development. However, we are concerned that Congress not foster bureaucracy and delay. Legislation should build on the State/Federal partnership with a simple planning and funding program using existing organizations and mechanisms. Complex, new Federal organizations, etc. are not needed.

S. 1178 -- S.1178 incorporates new coastal initiatives into ongoing programs and recognizes the ongoing National Estuary Program with deadlines and reporting requirements.

Management Conferences - The provision for management conferences is consistent with current requirements and comprehensively addresses the needs of marine waters. However, States or USEPA should be able to convene these initiatives. (Page 11)

Reporting -- The majority of pertinent water resources data and expertise resides with the States. For this reason, States should be integrally involved in developing the Report to Congress. Reports should be integrated into existing documents such as the 305(b) Report. (Page 17)

Penalties -- While it may be attractive to deposit all penalties in a national fund, that would preclude many uses of those funds at the State and Local levels which have benefited water quality and deterred violations in the past. Such deposits should be optional, with the appropriate use of penalties decided on a case by case basis. (Page 19)

Point Sources -- Waste minimization and decreased loadings are sound concepts which the States fully support. The effectiveness of such efforts in achieving and maintaining standards should, however, be considered in the context of overall all point and nonpoint source control needs which can be upstream in remote watersheds. State administrative resources, in many instances, may be better invested in control of nonpoint, air pollution, combined sewers, or stormwater, rather than complicated and protracted NPDES Section 402 demonstrations for coastal sources. (page 20)

Local Management Plans -- Local plan development may be appropriate where States have not acted, since Local governments are integral partners in pollution control. However, such activities must be consistent with applicable State/Federal laws and regulations. State technical assistance and oversight is, therefore, essential. (Page 25)

Combined Sewer Overflows - As the bill recognizes, CSOs are a major pollution source with many effective control techniques. And, as with most environmental programs, prevention is more effective than mitigation, which requires extensive time and resources. As drafted, the proposal may lead to a stalemate at the Local level with penalties but no action. This is due to the short deadlines and lack of funding for the State Revolving Loan and other water programs. (Page 28)

Criteria -- Sound information providing usable marine sediment criteria is necessary for future management actions in near coastal waters. Development of the criteria is complicated and requires a concerted effort on the part of State and Federal researchers. The bill oversimplifies this point. States also question the scientific and technical validity of using a conversion factor to translate numerical ambient standards into sediment standards. (Page 38)

Registry - The registry has potential to identify valuable coastal lands. It could be linked to State and Federal programs including coastal zone management and protection programs. With the involvement of scientists and landowners, this initiative could direct attention to coastal areas which are not receiving primary focus in existing estuary studies.

S. 1179 -- The Association supports the utilization of the Clean Water Act to implement marine programs, provided there are no separate actions or distinct reporting requirements to detract from the existing programs. The Association supports:

- Comprehensive assessment activities,
- Integrated implementation strategies, and
- Research initiatives on atmospheric pollutants, health impacts, economic impacts and algal blooms. (Federal agencies should take a leadership role in implementing research initiatives to provide useful scientific data for State implementation.)

The Association opposes:

- Unrealistic CSO deadlines and specific requirements which interfere with ongoing programs that already address CSO's in all waters.

- New marine pretreatment requirements, since such programs are already being implemented consistent with the proposed requirements in the bill.

- Reliance on numeric criteria for marine waters which can be one of the least effective regulatory approaches to control toxics, as previously discussed.

Estuarine and Coastal Environments -- Plant and animal life in estuarine waters can differ substantially from those in a coastal environment. The bill should be flexible enough to accommodate such distinctions.

Nonpoint Sources -- The bill requires USEPA to assist the U.S. Department of Agriculture in reducing pollution from cropland. This can help assure adequate priority in the Federal structure. However, State Water Quality Agencies are the primary repository of environmental information and should have the lead role in identifying lands for enrollment in the Conservation Reserve. (Page 17)

Funding -- Disapproval of plans at the outset due to lack of funding is premature and counter-productive. The strategy should identify resources needed to implement the recommended plan for use as the basis of generating funding. This should be a stepwise process with appropriate timetables if sufficient funding is not immediately available to implement the plan completely. (Page 8)

Monitoring -- The bill's requirements for standardized monitoring protocols may be partially satisfied by 40 CFR 136. States should not be limited to those protocols, but should be able to use alternative monitoring methods. (Page 30)

Federal Compliance -- The bill clearly articulates the responsibilities of industry as well as State and Local governments, but only requires Federal agencies to minimize potential adverse effects on the environment, considering practicable alternatives. It is essential that the Federal government be held accountable for meeting the same requirements as other pollution sources. (Page 34)

SUMMARY

The bills proposed address important environmental problems. We urge that they build on existing programs and accomplishments, placing priority on State implementation and integration of Federal activities. Legislation should be mindful of deficit problems. The nation does not need another "on the books" program building public expectations, which go unfunded because of deficit problems.

We appreciate the opportunity to comment on the legislation and look forward to working with the Committee in the future to protect marine resources. I would be pleased to answer any questions you might have at this time.

ENVIRONMENTAL POLICY INSTITUTE
FRIENDS OF THE EARTH
OCEANIC SOCIETY

STATEMENT OF CHARLES FOX
ON BEHALF OF FRIENDS OF THE EARTH,
ENVIRONMENTAL POLICY INSTITUTE, AND THE OCEANIC SOCIETY

BEFORE A JOINT HEARING OF THE SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION, SUBCOMMITTEE ON SUPERFUND, OCEAN, AND WATER PROTECTION, COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, UNITED STATES SENATE

ON THE PROTECTION OF MARINE AND COASTAL WATERS
(S. 1178, S. 1179, S. 587, S. 588)

JULY 12, 1989

Mr. Chairman and Members of the Subcommittee:

I am Charles Fox, Legislative Director of the recently-merged Friends of the Earth, Environmental Policy Institute and Oceanic Society. Joining me this morning is Boyce Thorne Miller, Staff Scientist of the Oceanic Society. Our statement this morning is made on behalf of the 45,000 members and supporters of our new global environmental advocacy group. Our organizations have worked on numerous ocean and coastal restoration and protection issues for almost two decades at local, state, national, and international levels. We greatly appreciate your invitation to appear here this morning to share our initial views on the various coastal legislative proposals being considered by this Committee.

Our statement today will briefly examine the scope of the nation's coastal crisis and the growing call for action from citizens groups and state and local officials. We will describe how existing federal programs are inadequate and offer our views on appropriate overall goals of new, comprehensive coastal legislation. We will conclude with a number of comments on what we see as some of the strengths and shortcomings of the specific legislative proposals introduced by Members of this Committee.

At the onset, we would like to commend the Majority Leader, Senator Mitchell, as well as Senators Chafee, Lautenberg, and Kerry for their recent introduction of comprehensive proposals to combat coastal destruction. Our nation's complex coastal problems demand aggressive new action from the federal government. We are confident that the continued attention of these and other coastal leaders will assure that truly effective coastal protection measures are enacted by the 101st Congress.

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A. The nation is facing a coastal crisis which threatens to destroy fragile ecosystems and undermine local economies.

This Committee has become well aware of the numerous threats to coastal ecosystems. This Committee is also aware that the complex nature of the problems will demand far-reaching actions in a number of important areas.

Growth and improper coastal development, for example, are a fundamental root of today's coastal crisis. These activities destroy sensitive habitats, increase pollution inputs and contribute to the loss of wildlife and aquatic resources. From 1950 to 1984, the population in coastal counties grew by more than 80 percent. Half of the nation's population lives and works within coastal counties which encompass less than 10 percent of the country's land mass. By 1990, fully 75 percent of the U.S. population will live within 50 miles of a coast.[1]

In addition, nutrient pollution threatens coastal waters, not unlike the problems which plagued Lake Erie in the 1960's and early 1970's. This pollution stems from many sources, ranging from agricultural and urban runoff to sewage treatment plant discharges. It contributes to harmful algae blooms, the loss of essential oxygen, and the destruction of underwater vegetation. In Chesapeake Bay, there has been a 15-fold expansion in areas without oxygen since 1950. In 1985 and 1986, a three- to four-thousand square mile area in the Gulf of Mexico experienced low dissolved oxygen. Oxygen loss also severely threatens the coastal waters of Connecticut, New York, New Jersey, and North Carolina.[2] The map we have attached to our statement, which was prepared by the U.S. Environmental Protection Agency, reveals the widespread problems associated with nutrient pollution.

Toxic contamination of coastal waters and sediments is also a serious problem which demands new action. It has been linked to tumors, cancerous lesions, skeletal anomalies and fin rot in fish and shellfish in highly contaminated portions of Boston Harbor, San Francisco Bay, Puget Sound, Santa Monica Bay, Chesapeake Bay, the Gulf of Mexico, New York-New Jersey Harbor, and the Great Lakes. It has led to issuance of numerous "public health advisories" to limit consumption of contaminated seafood.[3] Similar to nutrient pollution, toxicant sources are widespread, ranging from air pollution, to urban and agricultural runoff, to industrial discharges.

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[1] See *Coastal Waters in Jeopardy: Reversing the Decline and Protecting America's Coastal Resources*, Oversight Report, Committee on Merchant Marine and Fisheries, U.S. House of Representatives, December, 1988, and *Saving Our Bays, Sounds, and the Great Lakes: The National Agenda*, Save the Bay, Inc., Providence, Rhode Island, October, 1987.

[2] See *Near Coastal Waters Strategic Planning Initiative*, Office of Water, U.S. Environmental Protection Agency, Washington, D.C., August, 1986.

[3] See *Wastes in the Marine Environment*, Office of Technology Assessment, U.S. Congress, Washington, D.C., April, 1987.

Coastal ecosystems are among the richest, most productive environments on Earth. Approximately 87 percent of the dollar value and 82 percent of the weight of U.S. fish harvests are species which depend on coastal waters. Commercial landings of fish and shellfish had a wholesale value of $2.3 billion in 1985, not including the value of support services such as shipbuilding, fish processing and marketing. In 1980, almost 12 million Americans fished recreationally in U.S. marine waters, spending approximately $2.4 billion on food, lodging and equipment. National Park Service lands which include marine waters recorded more than 60 million visits in 1985.[4]

Yet, coastal resources have suffered severe declines in recent years. Striped bass harvests along the Atlantic coast dropped from 14.7 million pounds in 1973 to 1.7 million pounds just 10 years later, a decline of almost 90 percent. Almost three quarters of the productive shellfish areas in the Gulf of Mexico -- and almost two-thirds nationwide -- are restricted from harvest because of pollution problems. Underwater grasses, which serve as critical habitat and nursery grounds, have plummeted almost 80 percent in Chesapeake Bay since 1971.[5]

The local economic threats of this complex coastal crisis are severe. Tourism-related dollars spent in coastal regions have been growing steadily. Water-based recreation in the Great Lakes economy is estimated to generate $8-12 billion annually; it is Michigan's second major income sector after automobile production. A 1984 Florida survey estimated that over 13 million adults used state beaches with beach-related sales at $4.6 billion.[6]

The experience of New York and New Jersey during the past two summers has underscored the major threats to local economies. Attendance at state parks on Long Island dropped 50 percent after the first debris washed ashore and one New Jersey community reported that beach attendance was down from 1,200 people a day to 120 a day.[7]

B. State and local governments, citizens groups and the general public have issued a call for action from the federal government.

This mounting evidence of coastal ecosystem decline has generated widespread public concern and has triggered calls for action from the federal government. The National Association of Attorneys General recently adopted a 45-page "Blueprint to End

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[4] *Ibid.*
[5] *Ibid.*
[6] *Ibid.*
[7] *Coastal Waters in Jeopardy.*

Ocean Pollution" which identified a number of actions to be undertaken by federal, state and local governments.[8] The National Governors Association, at its meeting later this month, will recommend a host of new coastal protection actions for federal and state governments. These two initiatives are noteworthy both because of the comprehensive nature of the recommendations and because of their acknowledgment of major federal needs.

In October, 1987, 65 conservation organizations developed a comprehensive citizens agenda with a number of recommended federal actions to protect coastal waters and the Great Lakes.[9] During the past 6 months, over 40 organizations have helped launch the New England Coastal Campaign which, among other activities, will be recommending a number of federal initiatives to protect coastal lands and to improve enforcement of existing federal and state statutes. Similar citizens group efforts are underway in virtually every coastal region throughout the country.

Many state and local governments also have responded to public concern and have launched comprehensive coastal protection programs. Maryland, Virginia and Pennsylvania recently have advanced a series of commitments to restore Chesapeake Bay. In the past two years, the Great Lakes states have renewed pledges to work together to protect the Lakes. Other coastal initiatives have been implemented in California, Washington, Massachusetts, New Jersey, Rhode Island, and Florida, among other states.

We believe it is a crucial time for federal action. The federal government must seek to support and strengthen innovative state and local protection programs where appropriate. More importantly, the federal government must advance aggressive new mandates where state and local efforts fall short of what is necessary to restore and protect coastal waters.

The American public stands ready to support aggressive federal actions. A 1989 survey found that eight in ten citizens (82%) believe the federal government must become more involved in solving environmental problems. Seventy-nine percent of the public believe the government too often gives in to business interests when it comes to protecting the environment. More than two-thirds (68%) of Americans favor increased spending to improve the environment -- *even if it means raising their taxes.*[10]

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[8] *Blueprint to End Ocean Pollution*, Report of the Ocean Pollution Subcommittee for the Environment Committee, National Association of Attorneys General, November, 1988.
[9] *Saving Our Bays, Sounds and the Great Lakes.*
[10] *The Rising Tide: Public Opinion, Policy and Politics*, Analyses of polling trends written by: Americans for the Environment, Louis Harris and Associates, Tarrance and Associates, Greenberg-Lake/The Analysis Group, Washington, D.C., April 20, 1989.

C. Existing federal programs, administered by many federal agencies, do not adequately address priority coastal ecosystem threats.

As we have discussed, the primary threats to coastal ecosystems include: i) pollution, ii) improper development, and iii) sensitive habitat loss. Existing federal programs and levels of effort, however, are grossly deficient in each of these priority areas.

Numerous federal agencies, operating under many federal mandates, are involved directly in addressing these problems. This morning we will briefly discuss some of the primary efforts administered by the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), and the Army Corps of Engineers (Corps).

Coastal Pollution

Under mandates in the Clean Water Act (CWA), the EPA and states with delegated water programs have lead responsibility for maintaining "fishable and swimmable" coastal waters.[11] In the 1987 CWA Amendments enacted by Congress, EPA and state responsibilities were expanded significantly. However, as revealed in this Committee's oversight hearing on CWA implementation earlier this month, EPA has failed on *numerous* fronts to advance effective water pollution control programs.[12]

The National Estuaries Program (NEP) is EPA's primary effort to protect and restore coastal water bodies. Its focus is narrowly defined to so-called "nationally significant" estuaries. Its funding levels are extremely low ($13.3 million nationwide in FY 1989) and, under the existing statute, will become even lower with the phase-out of set-aside funds from the construction grants program. Most importantly, the NEP suffers from lack of leadership and the program's lack of authority.

The NEP's principle mechanism to advance coastal protection is management conferences involving federal, state and local officials and other interested parties. In practice, this structure has fostered the "least common denominator" approach to coastal management. In areas such as Chesapeake Bay or Puget Sound with strong state or local leadership, the NEP has been associated with some successful new actions. In other areas, however, its record remains poor.

EPA will argue that the "success" of the NEP depends upon retention of "flexibility" and maintenance of its "equal partner" relationship with state and local governments. We strongly disagree. One of the NEP's most significant accomplishments was the commitment for a 40 percent reduction in nutrient pollution from Chesapeake-area governments. This commitment was largely a result of EPA action alone and not the product of "equal partner" dialog with state governments. In fact, there is little question that EPA could have *mandated* such an action some time ago -- with or without the NEP process -- based on water quality data which showed dissolved oxygen levels well below minimum state standards.

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[11] *Federal Water Pollution Control Act of 1972*, Public Law 92-500, 86 Stat. 816.

[12] See *Testimony of the Natural Resources Defense Council*, Subcommittee on Environmental Protection, Committee on Public Works, United States Senate, June 16, 1989.

Coastal Development

The Coastal Zone Management Program, administered by NOAA, is the primary coastal protection program aimed at controlling improper growth and development. It is implemented through state adoption of federally-approved Coastal Zone Management Plans. State plans vary considerably in structure and in effectiveness. Fundamentally, the Coastal Zone Management Act itself establishes what some believe to be conflicting policies in its mandate to both "protect" and "develop" the nation's coastal zone.[13]

The CZMA was enacted back in 1972. Although it is a voluntary program, all marine coastal states except Georgia and Texas are participants in the program. Total FY 1989 funding levels were approximately $40 million ($34 million in grants to states, $3 million for estuarine research reserves, and approximately $3 million for national program implementation). Both the Reagan and Bush Administrations have sought to completely eliminate funding for the CZMA.

Federal influence over voluntary state CZM programs is based largely on incentives offered to state governments in the form of annual grants and so-called "consistency" provisions which require that federal activities in the coastal zone must be consistent with state CZMA programs.[14] If state programs fail to protect (or develop) coastal ecosystems adequately, the federal government's only recourse is to deny the small annual grant funds and/or disapprove the state program.

Overall, the CZMA has focused attention successfully on the need for planning in the coastal zone. However, it has produced mixed results in controlling improper growth and development. The State of Maryland, in its enactment of far-reaching proposals to protect Chesapeake Bay, largely abandoned its CZM program in favor of a much more stringent Critical Areas Commission. Similarly, the State of New Jersey's recent proposal for a Coastal Commission went far beyond the state's existing CZM program. In Massachusetts, the proposed Cape Cod Commission and its broad new authorities are a direct response to public concern that growth and development are poorly controlled under existing programs.

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[13] *Coastal Zone Management Act of 1972*, Public Law 92-583, 86 Stat. 1281.

[14] A 1984 Supreme Court ruling limited federal consistency (section 307(c)(1)) by finding that offshore oil and gas leasing was not subject to CZMA consistency requirements. Since that time, a number of federal agencies have taken a broad interpretation of the decision and have attempted to exempt many of their activities from consistency determinations. We believe that Congress should act to fully restore the original intent of statute.

Habitat Loss

The Army Corps of Engineers under authorities mandated in the Clean Water Act and Rivers and Harbors Act is responsible for regulating dredging and filling activities in navigable waters. As a result, the Corps has primary responsibility to protect coastal wetlands and to control dredging activities which commonly occur in highly contaminated coastal bays and harbors. (It should be noted that other federal agencies, notably EPA, NOAA and the Fish and Wildlife Service, also have important responsibilities in coastal habitat protection.)

As this Committee is well aware, the wetlands permitting program administered by the Corps has failed to protect the nation's coastal wetlands, particularly nontidal wetlands in coastal watersheds. Fundamentally, the existing permit-by-permit approach neglects cumulative wetland losses. The obvious result has been continued wetland losses to urban, suburban and agricultural development. Additionally, poor enforcement, inadequate consideration of development alternatives, lack of coordination with other federal agencies, and absence of simple "bureaucratic will" have plagued the Corps' wetlands permitting program.

The existing Corps dredging program also results in substantial coastal degradation. Highly contaminated sediments, which contribute to severe declines in water quality and coastal resources, have been identified in many coastal bays and harbors throughout the country, including many areas in the Great Lakes. In some regions, these sediments must be removed or isolated to protect coastal ecosystems. In areas with ongoing or planned dredging activities, special handling and disposal of contaminated sediments is essential.

The Corps' existing narrow mandate for navigational dredging has limited action on environmentally-beneficial remedial measures to address contaminated sediments. Moreover, the Corps' existing sediment classification scheme has prevented adequate evaluations on the extent of sediment contamination. Consequently, appropriate handling and disposal techniques are not always implemented.

D. A number of overall goals should guide this Committee's consideration of comprehensive coastal legislation.

At this first hearing on coastal protection legislation, we would like to describe a number of important goals for the Committee's consideration. We believe that achieving these goals is essential in developing a truly effective responsive to the nation's coastal crisis.

1. The cumulative effects of growth and development should be integrated into new proposals to control pollution and protect coastal lands.

Overwhelming evidence suggests that virtually all coastal areas must *reduce* pollution inputs and *improve* aquatic and terrestrial habitats. Given coastal population growth projections, mounting development pressures, and increasing pollution loads, this will not be an easy task. However, simply providing for "no net increases" in coastal pollution or "no net losses" of coastal habitats will not be sufficient to restore and protect coastal ecosystems.

It is crucial that this monumental challenge be met by Congress. As the nation painfully learned with the federal Superfund program, it is far cheaper and wiser to *prevent* toxic waste dumps in the first place. These unfortunate lessons should be considered for coastal ecosystems. In ten or twenty years it will be virtually impossible to remove coastal development, to restore lost habitats, or to reclaim polluted coastal waters. *Prevention* must be the cornerstone of new legislative initiatives.

2. Citizens should be given new tools to strengthen and stimulate their involvement in coastal decisionmaking.

Coastal citizens organizations throughout the country have experienced tremendous growth in response to widespread public concern of coastal degradation. These organizations are often best informed of the successes and failures of federal, state and local protection programs. The comments and views of these groups should be solicited and encouraged by this Committee as it develops legislation during the 101st Congress.

Equally important, new proposals should provide ample opportunities for citizen involvement. Coastal data and information should be made available in understandable and usable forms. State and local governments should be encouraged to strengthen citizen participation in decisionmaking. Numerous legal remedies for citizens should be made available.

3. New federal actions should apply to *all* coastal areas.

We believe it is inappropriate to establish a "tiered" system of protection whereby some coastal regions receive special attention or new authorities and others do not. Such a policy suggests that certain areas be "written-off," whether they be too degraded, too healthy or simply lacking sufficient political clout. The overwhelming scientific evidence suggests that all coastal regions are ecologically important and that all regions need new protective measures.

We understand and appreciate the need to establish priorities and that different regions face different threats. However, this must not result in uneven or discriminatory federal policies.

4. New federal legislation should include the Great Lakes coastal ecosystem.

As underscored by Senator Levin's recent field hearing[15] of the Governmental Affairs Committee, many of the problems in the Great Lakes are similar to the threats of marine coastal waters. The existing Coastal Zone Management Act defines "coastal zone" to include Great Lakes land and water. New coastal legislation advanced by this Committee should include a similar, broad definition of coastal waters.

The Great Lakes cleanup effort launched with the Water Quality Agreement of 1978 signed between the U.S. and Canada has served in many ways as a model for coastal ecosystem management. Many important lessons could prove valuable in implementing new national coastal protection programs.

5. Broad, new strategic planning and implementation initiatives should not be required of state governments without substantial new federal authorities and resources for oversight and implementation.

Simple requirements that state governments prepare and implement coastal protection plans will not be effective without *substantial* new federal authorities and resources for oversight and implementation. The history of such broad federal environmental mandates suggests that little will be accomplished without the support and ongoing involvement of the federal government.

State and local governments must be given adequate resources to assure effective implementation of the new legislation. Trust funds and other appropriate financing mechanisms with state and local matching requirements should be included in the legislation. Adequate federal agency funding for program implementation must be provided as well.

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[15] Subcommittee on Oversight of Government Management, Committee on Governmental Affairs, United States Senate, Grand Rapids, Michigan, April 28, 1989.

6. Federal programs administered by many agencies and Departments must be coordinated and, where necessary, redirected to improve coastal ecosystems.

As we have mentioned, numerous federal programs and policies affect coastal ecosystems. However, coordination among agencies is poor and some federal programs actually undermine coastal protection.

For example, the U.S. Department of Agriculture has implemented its landmark conservation programs with only recent minor attention to coastal water quality benefits. Moreover, some its small watershed projects actually destroy wetlands and increase pollution loads to coastal waters at significant expense to the nation's taxpayers.

New coastal legislation should examine changes to federal programs and policies administered by the Departments of Interior, Commerce, Defense, and Agriculture, as well as the Environmental Protection Agency, the Federal Emergency Management Agency, and the Internal Revenue Service.

E. We have a number of initial comments and recommendations on the specific legislative proposals for the Committee's consideration.

We would like to provide for the Committee a number of specific comments on S. 1178 and S. 1179 which advance important new coastal protection measures. Our comments on S. 587 and S. 588, pertaining to marine research and monitoring, will follow this discussion.

1. Designation of Degraded Coastal Waters

There is a need for increased protection of and emphasis on coastal waters which are currently degraded in order to restore them to a healthy, productive state. Both S. 1178 and 1179 call for additional protective measures for such degraded waters.[16] However, as discussed above, we must caution that this emphasis should not be at the expense of the remaining coastal waters. Coastal waters which are currently in a relatively healthy state must be maintained. In such areas it is possible to prevent the degradation of the marine and coastal environment -- this should be a major emphasis of the legislation as well. We must learn from our past mistakes that cleanup and restoration, while vitally important, is expensive and technically difficult.

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[16] H.R. 2647, introduced by Representative Studds on June 14, 1989 also calls for increased protective measures for coastal waters which are not achieving the applicable water quality standards or that are threatened by increased pollutant loadings and also calls for the development of individual control strategies for these areas. H.R. 2647 also calls for the designation of "outstanding resource waters" which are also to receive additional protection.

Section 101 (which amends section 320 of the Clean Water Act) of S. 1178 requires the Administrator of EPA to identify and designate within 18 months of enactment of the Act:

> all estuaries and coastal waters experiencing a general degradation of environmental conditions and which do no support a balance, indigenous population of shellfish, fish, and wildlife and allow for recreational activities in and on the water.

The Administrator is then required to convene a management conference[17] to, among other things, assess trends in water quality and develop a comprehensive environmental protection plan that recommends priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution. In addition, under section 101, the Administrator is given "special authorities" which apply only to those waters designated under that section. These authorities include, among others:

A) that the Administrator or applicable state agency can issue or renew a discharge permit to such waters only if: (i) a need to discharge to the designated waterbody based on a showing of full utilization of available waste minimization practices and technologies and the lack of alternative production processes or disposal options; and (ii) that a proposed new discharge, or any increase in volume or toxicity of an existing discharge, will be offset by a decrease in other discharges or loadings to the waterbody resulting in no net increase in pollutant loading to the waterbody;

B) that the Administrator or applicable state agency issue permits for industrial and municipal discharges of stormwater within six months of the designation pursuant to section 101;

C) require that each sewage treatment plant, regardless of size shall develop and enforce facility-specific programs for the pretreatment of industrial wastes;

D) require the Administrator, where a state has failed to do so, to conduct a nonpoint source pollution assessment and prepare a management program for the watershed of such designated waters within 18 months of designation.

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[17] Management conference membership is to include, at a minimum, each federal and foreign nation located in whole or in part in the waterbody for which the conference is convened; international interstate or regional agencies having jurisdiction over all or a significant part of the waterbody; each interested federal agency; local governments; and affected industries, public and private educational institutions, and the general public.

Similarly, Section 5 of S. 1179 requires the Administrator of EPA to designate "marine areas in need of protection" within one year of enactment of the Act and outlines some general criteria for designation. Each state is then required, within 18 months of designation, to submit to the Administrator for review and approval an individual management strategy that the state will implement "so that the area no longer needs additional protection as soon as possible, but no longer than three years after the date of establishment of such strategy." In cases where the "marine area in need of protection" is located within the jurisdiction of more than one state, the administrator shall treat that estuary as a "priority estuary" under the National Estuary Program under section 320 of the Clean Water Act.

As mentioned above, while we support the designation of degraded coastal waters for the purpose of implementing comprehensive management plans, as proposed in S. 1179 and 1178, we believe that the "special authorities" given to the Administrator or the applicable state agency as proposed in S. 1778 should apply to all estuarine and coastal waters.[18] For example, the requirement under Section 102 of S. 1178 that an applicant must show a need to discharge based on a showing of the full utilization of available waste minimization practices and technologies and the lack of alternative production processes or disposal options should be a requirement for all discharges into estuarine and coastal waters. As such we prefer Section 8 of S.1179 which has a similar requirement but is applicable to all discharges into the marine environment.

2. Enforcement

The failures of many of the current programs required by the Clean Water Act, and indeed by many other environmental laws, are directly due to the lack of compliance and enforcement of the law and its regulations. Given the enormous burden on the Federal and state governments to effectively monitor compliance with and enforce the requirements of the Clean Water Act, perhaps a fresh look at enforcement is needed.

Economic incentives for the elimination of discharges should be examined. Such an approach is taken in H.R. 2647 which requires discharge fees for all point source dischargers except publicly owned treatment works and all significant industrial users of POTWs that discharge pollutants into coastal waters.

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[18] One important exception is the "no net increase in pollutant loadings" requirement of section 102 of S.1178. In principle we do not support a requirement that level of discharges anywhere in the marine environment be maintained, but rather that the level of discharges should be reduced. More broadly, the "no net increase in pollutant loadings" requirement appears to weaken the zero discharge goal of the Clean Water Act.

While not wedded to the approach taken in this bill, we believe the idea merits the Committee's attention -- both as a revenue raiser and as an economic disincentive to discharging pollutants into coastal waters.

Another approach which merits the Committee's attention is the "environmental auditor" provisions of H.R. 2647. These provisions require the establishment of an independently certified group of environmental auditors to ensure compliance with the requirements of the Clean Water Act. It should be emphasized, however, that dischargers should fund the costs of the auditing program.

One aspect of the Clean Water Act that deserves a new look with respect to enforcement is the pretreatment program. Congress established the pretreatment program in the 1977 amendments to the Clean Water Act in order to reduce the amount of toxics entering the municipal sewage system. Toxics entering the sewage system contribute to the contamination of receiving waters, the contamination of sewage sludge, and can impair sewage treatment facilities.

A recent GAO study found that "industrial users were in considerable noncompliance with discharge limitations under the pretreatment program." The GAO's survey results found that sampling inspections of major treatment plants disclosed that 41 percent of their industrial users exceeded one or more applicable discharge limits during the 12-month period examined. Additionally, the report found that while EPA relies on treatment plants for enforcement, these plants have generally demonstrated a reluctance to take strong enforcement actions.[19] This enforcement gap must be filled and, at minimum, much stronger oversight by the state and federal government is needed.

3. Standards and Criteria for the Protection of the Marine Environment

In addition to technology-based standards which apply to categories of industries to control the level of pollutants in direct discharges, the Clean Water Act calls for the establishment of ambient water quality criteria and standards where technology-based standards are not sufficient to protect water quality.[20] Current law requires that EPA establish water quality criteria and that the states adopt those criteria in the form of numerical standards. Through the wasteload allocation process, these ambient standards are translated into specific effluent limitations for various dischargers to a particular receiving waterbody.

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[19] U.S. General Accounting Office, Water Pollution: Improved Monitoring and Enforcement Needed for Toxic Pollutants Entering Sewers. Report to the Chairman and Ranking Minority Member, Subcommittee on Investigations and Oversight, Committee on Public Works and Transportation, House of Representatives, (GAO/RCED-89-101, April 1989).

[20] *Federal Water Pollution Control Act*, as amended, 33 U.S.C. section 1313 and 1314.

We applaud S. 1178 and S. 1179 for emphasizing the need for the development of criteria and standards for the protection of the marine environment. The development and adoption of water quality criteria and standards for the marine environment has lagged far behind that of the freshwater environment, according to a report of the Office of Technology Assessment.[21] This is especially true for the adoption of marine-water quality standards by coastal states for the 126 "priority pollutants." For example, the report notes that nine of the 24 coastal states have no marine water quality standards for priority pollutants, and 16 coastal states have no such standards for priority metals or cyanide. For the eight coastal states that have any marine standards for priority metals or cyanide, standards have been developed for an average of 4.5 of the 14 priority metals. For the 15 coastal states that have any marine standards for priority organic chemicals, standards have been developed for an average of about 7 of the 85 priority organic chemicals.

In addition to the need for the expansion of marine water quality criteria and standards, there is a need to develop sediment quality criteria and biological criteria. Traditionally, the development of water quality criteria has focused too narrowly on physical and chemical parameters. The addition of biological criteria will further aid in protection of marine and coastal resources. In highly dispersive marine environments, the average concentration of pollutants may not reflect the true level of pollution. Slow but constant input of pollutants may not result in a buildup of the substances in a turbulent water column. However, in these situations as well as in areas with measurably high pollutants in the water and sediments, the contaminants will enter the food chain. Consequently, the concentrations in living tissue may be even better indicators of the true levels and threats of pollution. Because tissue concentrations can serve as a good indicator of the effects of pollution on the ecosystem and because the pollutants in resource species can pose human health problems, we strongly support the requirement in S. 1179 to develop living marine resource biological quality criteria.

We have several comments with respect to both bills' provisions on marine water, sediment and living marine resource biological quality criteria:

- Given the poor performance of states in adopting marine water quality standards and the need for stringent national standards, it is our opinion that EPA should be given the mandate to implement marine standards as proposed in S. 1178. The states, however, should maintain the right to establish more stringent standards as proposed in S. 1178, section 106(a).

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[21] *Wastes in the Marine Environment.*

- The pollutants listed in S.1179 (Sec 7(a), amendment 304(a)(9)(D)) for criteria development should not be taken as an all inclusive list but only an initial list of pollutants to be addressed. Specific provision should be made for the subsequent addition of pollutants by the Administrator or by petition to the Administrator as in S.1178 (Sec 106(a), amendment Sec. 303(i)(3)).

There is an urgent need for sediment quality criteria and standards, but how these are developed and implemented will determine whether they are effective in evaluating marine environmental conditions. Therefore, any comprehensive coastal legislation that includes provisions for sediment quality ought to clearly define a procedure (or set of procedures) that will ensure that adequate standards are adopted and enforced for all marine environments. Although both S.1178 and S.1179 address the problem and propose promulgation of marine sediment quality standards, both bills need further clarification in this area.

In particular, our concerns are as follows:

- There is a need for sediment quality criteria in the Great Lakes as well as marine waters and the legislation should include provisions for development and adoption of freshwater sediment criteria and standards.

- It should be recognized that setting appropriate and effective numerical standards for marine and freshwater sediments is a complicated matter and that standards must accommodate differences in different types of ecosystems. The simple numerical conversion of water quality standards to sediment quality standards as proposed in S.1178 (Sec. 106(a), amendment Sec. 303(i)(7)) is inappropriate and cannot be scientifically justified.

- Sediment criteria should be developed with the most sophisticated and up-to-date methodology (including state-of-the-art bioassay methodology). Again, differences in different ecosystems must be recognized (e.g. indigenous species should be used for bioassays in different regions and types of ecosystems). To ensure the most effective application of current scientific knowledge, the methodology used and approved by EPA in establishing and implementing criteria and standards should be subject to review by and require approval of the National Research Council of the National Academy of Sciences.

- To hasten the process of establishing sediment quality standards nationwide, EPA should be given the mandate to promulgate federal standards, while equivalent or more stringent State standards would have precedence, as specified in S.1178.

- The legislation should require that the promulgated standards be incorporated into all appropriate environmental programs, including renewal and issuance of NPDES discharge permits, development of nonpoint source pollution control programs, wasteload allocation models and development of toxic "hot spots" remediation.

- The legislation should provide for a comprehensive national identification of sites which fail to meet sediment criteria or standards.

- The legislation should require that EPA, in consultation with the Army Corps of Engineers, designate Best Available Technologies for all remedial actions and dredging activities in areas where sediment quality standards are exceeded.

- The mission of the Army Corps of Engineers should be expanded to include the responsibility for remediation of contaminated sediments, as well as for maintaining navigation. Where EPA determines that dredging to remove contaminated sediments is needed and would not endanger the surrounding environment, the Corps should have the authority to carry out that dredging.

- The current ad hoc Contaminated Sediments Task Force in EPA should be institutionalized and the Agency should be required to include a line item in its budget for sediment quality activities. Significant funding should be provided to fulfill the sediment quality provisions of the proposed coastal legislation and to carry out programs already authorized by Congress (such as EPA's Contaminated Sediment Demonstration Project for new treatment technologies).

4. Contaminated Dredge Material

Contaminated dredge material is a major problem in coastal marine and Great Lakes environments and it is essential that a consistent procedure for its management be established. However, the provisions for identification and management of contaminated sediments in S.1178 appear to be a step backwards with respect to protecting marine environments. Sediments determined to be contaminated should not be allowed to be ocean dumped at all. In fact, currently this is the policy. In practice, however, some contaminated material is ocean dumped because it falls under the Corps' category of "uncontaminated." To correct this, we need more effective methods and criteria for determining whether particular sediments are or are not contaminated. We do not need the legal authorization of ocean disposal of dredge materials which contain contaminants in concentrations exceeding sediment quality standards. If such ocean disposal is permitted, the sediment quality standards become meaningless.

Consequently, we would like to see the provisions of Sec. 202(a), amendment 1412(f), of S.1178 omitted from the legislation. Instead, there must be other provisions for disposing of contaminated dredge material outside the ocean or Great Lakes. Similarly, Sec. 205(1) amendment Sec. 404(u)(2) should prohibit the issuance of a permit for the water disposal of contaminated material and should include other provisions for disposal of that material.

We generally support the terms proposed for site designation in Sec. 204 of S.1178. In particular, the requirement for a management plan, which would include a monitoring plan, for each site designated is highly desirable. We would also recommend that NOAA, in cooperation with EPA, take the lead role in developing this monitoring plan, since that agency is best equipped to handle that requirement.

Ideally, this plan should be developed before the final selection of the site because it would demonstrate whether the site can be adequately monitored and managed. In any case, the plan must be completed before the site is used and it must be open to public review before it is finalized. The requirement for a baseline study, however, must be done as part of the site selection process. There is no way to determine whether a site is suitable for disposal unless an environmental baseline study has been done.

We support the review of the site designations every 5 years. If an adequate monitoring program has been followed, there should be sufficient information on which to determine whether dumping at the designated site has caused unreasonable degradation to the environment and, if so, use of the site should be terminated.

We believe that the provision for the promulgation of monitoring protocols in S. 1179 (Sec. 13(c)) is a necessary element of comprehensive coastal legislation and is an important companion to the requirement for disposal site management plans, which are to include environmental monitoring plans. We would suggest that the Administrator and (instead of "in consultation with") the Under Secretary develop the protocols for monitoring water, sediments and living marine resources. These protocols, of course, will apply to all monitoring programs, not just the monitoring of ocean disposal sites.

5. Coastal Research and Monitoring (The Marine Research Act of 1989, The Regional Marine Research Trust Fund, and provisions in S. 1178 and S. 1179)

There is a major need for strengthened research and monitoring programs, particularly to assist implementation of new coastal legislation. S.1178 iterates a research and assessment program laid out in the Clean Water Act, which requires long-term monitoring of pollutant concentrations, marine ecology and other physical/biological parameters; ecosystem assessment programs; comprehensive water quality and sediment monitoring; assessment of partitioning of nutrients, sediments and pollutants in designated water bodies; and a review and analysis of available environmental data.

In addition, S.1179 outlines research and monitoring programs on atmospheric pollutants, floatables, algal blooms, health impacts and economic impacts and provides for the development of monitoring protocols. All this research and monitoring (as specified in both bills) is essential to the successful implementation of standards and criteria and analyses required for regulating activities permitted and prohibited by the legislation.

If we are serious about this legislation and about controlling pollution in marine environments, research and monitoring will have to be funded at unprecedented levels. Provisions for this funding will have to be made in any comprehensive coastal legislation that is finally passed. The Marine Research Act of 1989 can also provide for some of the needed research and monitoring and, if the recommended levels of appropriation are significantly increased, this bill could provide an extremely useful and effective foundation of information for implementing coastal legislation. Without an increase in funding levels, however, it cannot fulfill such a role.

The advantages of using the Marine Research Act as the research and monitoring arm of comprehensive coastal legislation are numerous. Having a strong regional component in the development of national marine criteria and standards is recommended because it can avoid the pitfalls of generalizing on the basic species and environmental conditions not characteristic of ecosystems to which the standards are to be applied. Furthermore, the monitoring programs needed for environmental assessments and management programs required by the legislation are for the most part regionally focused.

The following discussion reviews the provisions of the Marine Research Act and supports the concept of regionally focused research programs.

A. A regional approach to coastal pollution problems is desirable.

Several indicators of marine environmental quality point to deteriorating conditions in the coastal marine ecosystems of this country. Increases in (1) episodes of low oxygen concentrations in the water column, (2) fish and shellfish diseases and anomalies, (3) contamination of tissues by heavy metals and organics, (4) phytoplankton (algal) blooms, (5) habitat loss -- especially loss of wetlands, (6) reproductive problems among birds dependent on the marine environment, (7) changes in the benthic community structure, including species diversity of bottom dwelling animals and plants, and (8) closures of shellfish and fishing areas for human health reasons are symptomatic of a multitude of anthropogenic insults accumulating in our coastal waters.

Though the symptoms are often the same, the particular problems causing marine ecosystem degradation may differ from location to location. For this reason, many researchers and regulators advocate a regional approach to trying to solve the problem of coastal pollution. This avoids the problems of inadequate funding and differing, sometimes opposing, strategies which can occur on local levels -- often resulting in fragmented, uncoordinated work on regional ecosystems -- while still allowing research to respond to the problems peculiar to each region. The various marine provinces have differing hierarchies of anthropogenic pollution, and the ecosystem responses to vary with regional differences in the physical and biological environment. Regional centers could concentrate their research programs in areas most appropriate to their own set of problems. Coordinating research at the regional level would encourage innovative multidisciplinary programs targeting specific regional needs, which in turn should enable more rapid and effective management decisions to be made in each region.

We need to address the coastal pollution crisis with programs which are answerable to regional estuarine marine systems in distress, not to the vagaries of national political climates. We favor the organizational plan proposed in the bill, which gives the Federal Marine Research Coordinating Board circumscribed "review and approval" responsibilities, while giving the Regional Marine Research Centers the mandate to determine and oversee individual regional agendas. In our view, it is not necessary or desirable for the Federal Board to prescribe stringent criteria, as this would tend to direct research programs toward a national agenda rather than the desired unique regional agendas.

As provided in the bill, the Regional Centers would be guaranteed the power to set their own agendas --agendas that are likely to differ from national agendas and those of other regions. While we endorse this regional approach, we would recommend that the Regional Research Plans take into account the needs, goals and priorities being developed in adjacent regions, so that multi-regional issues can be addressed effectively.

This coordination will be essential if the Marine Research Act is used to support some of the research and monitoring needs of comprehensive coastal legislation. The development of national criteria and standards for water, sediment and living marine resource quality will benefit tremendously from regional research contributions. Furthermore, monitoring requirements will be targeted at whole ecosystems, so more often that not, specific monitoring programs will be regional.

B. The framework for interfacing between scientists and citizens is desirable.

The board of directors and a research advisory group of each Regional Marine Research Center provides an opportunity for interfacing among selected policy makers, regulators, researchers, fishermen, industrialists, other users and representatives of environmental groups. This is one important way in which this bill distinguishes itself from other existing programs (Sea Grant being the notable exception), and the opportunity for effective collaboration at this level should be promoted aggressively. This interactive role could be strengthened in S.587, however, and in our opinion it would strengthen the whole bill.

S.587 provides for input by the research advisory group in advising the board of directors and a forum for review of research plans by affected user and interest groups. It also provides for the board of directors to submit scientific recommendations and nontechnical reports on the status of marine environmental quality. However, there is no provision for an open forum of direct exchange between scientists conducting research and users and interest groups trying to utilize the scientific information. This could be provided for and would, in our view, be highly desirable.

C. The funding level should be significantly increased.

Since basic and applied research, baseline studies and monitoring are all essential to understanding and assessing marine ecosystems, and all will be needed to support and fulfill the requirements of the proposed comprehensive coastal legislation, our recommendation is to significantly increase the maximum levels at which the Regional Centers can be funded.

In the absence of such an increase, some hard choices will have to be made. Instead of ending up with programs weak in every area, we recommend a system by which each Regional Center assesses its priority needs relative to basic and applied research and monitoring.

Basic and applied research provides information on how a system and its components respond to specific stresses. With this information, predictions can be made about the likely consequences of proposed activities in the regional marine environments. Such information can also be used in the development of national criteria and standards which take sufficient account of regional ecosystem differences.

In various forums including Congressional hearings, a strong case has been made for research which would give us a better understanding of how the whole ecosystem performs as it responds to various stresses imposed by human activities. This would suggest that basic research is called for and ought to be a central element initially. Under the Marine Research Act, basic research would be encouraged in all coastal environs, regardless of their stage of degradation. That effort would allow valuable comparisons to be made among systems less stressed and those in a crisis situation, with the anticipated result that new crises can be prevented. This approach contrasts sharply with current national research and monitoring programs which have targeted a limited number of specific estuaries with intense pollution problems.

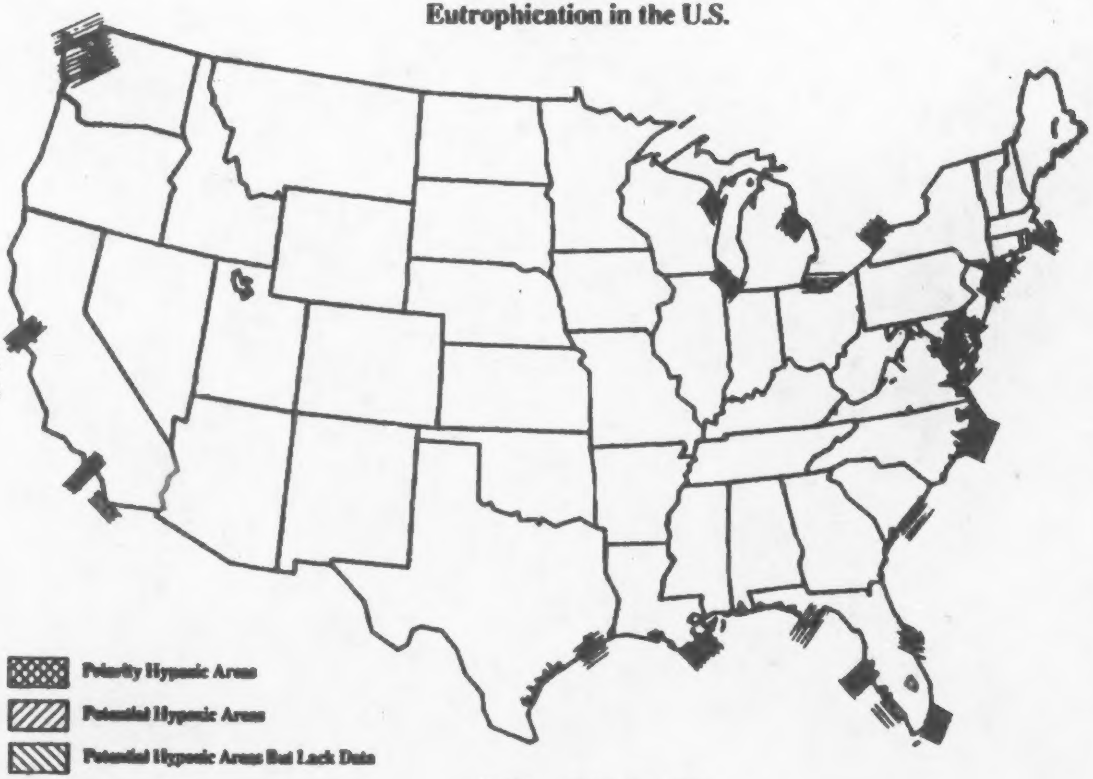
Environmental monitoring programs are implemented in association with polluting activities, documenting the consequences. They are generally expensive, long-term programs. Effective, well designed monitoring allows us to determine whether ongoing activities are causing changes (either desirable or undesirable). The combination of basic and applied research and baseline studies provide the basis for designing effective monitoring programs to be carried out by institutions able to commit staff and equipment for long enough time periods to make monitoring meaningful.

Monitoring programs are best directed by the results of basic and applied research, and it should be expected that the most meaningful, best designed and most efficient monitoring programs will evolve from regionally oriented basic and applied research performed under the Marine Research Act or other sponsorship. Furthermore, because of the long term staffing and monetary commitment usually necessary, Federal agencies may be better equipped to meet some of the monitoring needs on the regional level. The Regional Centers should carefully coordinate monitoring programs with agencies such as NOAA, EPA, MMS and USGS. If the Regional Centers are not funded at a level which allows for effective long-term monitoring in addition to the essential basic and applied research, it will become mandatory for the comprehensive coastal legislation to provide funds for such monitoring through the Federal agencies.

Thank you for the opportunity to present our views.

FIGURE I-4

Areas of Concern for Hypoxia
and
Eutrophication in the U.S.


Priority Hypoxic Areas
Potential Hypoxic Areas
Potential Hypoxic Areas But Lack Data

SOURCE: Whitledge, 1985

F·I·S·H

The Coalition for the Conservation of Aquatic Habitat

STAN MOBERLY, Chairman
P.O. Box 99488, Seattle, WA 98199-0488
(206) 283-4844 or 4722) FAX 206-285-3250

American Bass Association, Inc
American Fisheries Society
American Fishing Tackle Manufacturers Association
Atlantic Offshore Fishermens Association
Bass Anglers Sportsman Society
Coastal Conservation Association
Coastal Society
Coin Depot Corporation
Columbia River Inter-Tribal Fish Commission
Fisheries Management Foundation
In-Fisherman, Inc.
Izaak Walton League of America, Inc.
Bob Martin, Member Mid-Atlantic Fisheries Management Council
National Coalition for Marine Conservation
National Fisheries Institute
National Fisherman
National Wildlife Federation
New Jersey Marine Sciences Consortium
Outdoor Writers Association of America
Pacific Coast Federation of Fishermen Association
Guy Thornburgh, Executive Director Pacific Marine Fisheries Commission
Saltwater Sportsman
Southeastern Fisheries Association
Sport Fishing Institute
Spring and Groundwater Resources Institute
Texas Shrimp Association
Trout Unlimited
United Fisherman of Alaska
United States Tuna Foundation

Statement of

Paul Brouha

Deputy Director, American Fisheries Society

on behalf of

F.I.S.H.

Fishermen Involved in Saving Habitat

Before the

Senate Environment and Public Works Subcommittees

on

Superfund, Ocean, and Water Protection,and

Environmental Protection

regarding

protection of marine and coastal waters

July 12, 1989

FISHERMEN INVOLVED IN SAVING HABITAT

Mr. Chairman and members of the Subcommittees, I thank you for the opportunity to appear before you today to present the views of F.I.S.H. — Fishermen Involved in Saving Habitat regarding protection of coastal areas from the effects of pollution.

I am Paul Brouha, Deputy Director of the American Fisheries Society which is headquartered in Bethesda, Maryland. I have been asked to represent F.I.S.H. before you today because our Society is a member of this coalition for the conservation of aquatic habitat. F.I.S.H.'s mission is to elevate to the highest levels of government the need for a national policy to protect, conserve, enhance and restore the quality and diversity of fisheries habitat throughout the nation. This nationwide coalition brings together for the first time, all segments of the fishing community. Members of the coalition represent commercial fishermen, processors, distributors, recreational anglers, tackle manufacturers, conservation organizations, the scientific community, and fisheries managers. All of us are concerned about and are reacting to the serious loss and continuing degradation of fish habitat and the resulting potentially bleak future for our nation's fishery resources. We have focused our attention on the conservation of aquatic habitat that is the foundation for these resources.

The health of fish populations, and the many benefits Americans receive from them, are tied inseparably to the quality of the nation's inland and marine waters. The quality of these waters has deteriorated steadily since the beginning of the Industrial Revolution, and the pace increased dramatically under the impact of the "chemical revolution" during this century. Not until the late 1960's and 1970's did the nation begin to address the problems of water quality loss.

Since the 1960's, when the first laws designed to protect and improve water quality were passed, much progress has been made. Yet the lofty goal of the Clean Water Act -- 100% fishable and swimmable waters by 1985-- has not been reached and continues to be elusive.

Fisheries benefits currently at risk include:

- 60 million sport anglers spending about $30 billion in their pursuit of fish;
- 700,000 full-time jobs derived from recreational fishing;
- more than 1 billion user days of recreation;
- commercial fisheries contributing $30 billion of economic activity to the nation's Gross National Product.

Members of F.I.S.H., a coalition for conserving aquatic habitats, believe the quality of the nation's water is not being improved rapidly enough. F.I.S.H. members have a keen interest in fisheries resources as an asset to the nation and share an increasing dissatisfaction with the pace of water quality improvement. The group advocates the conservation of the aquatic habitat necessary to support a healthy fishery resource for the country.

Because water pollution is a major factor in the degradation and loss of aquatic habitat and upon fish populations as well as the ability of humans to consume fish without risk to their health, it has been chosen as a high priority issue for the F.I.S.H. coalition's attention.

DEFINITION

For practical purposes, water pollution can be defined as a substance or organism present in a waste, or a property of a waste (such as acidity), that has the potential to adversely affect aquatic resources or humans (from the Office of Technology Assessment report Wastes in Marine Environments, 1987).

TYPES OF WATER POLLUTION

Water pollution results from two general categories of sources: point and non-point.

A. Point Sources. Point sources of water pollution are the discrete, "end of the pipe" sources of which industrial and municipal effluent discharges are examples. Ocean dumping of sewage sludge, industrial wastes, and other materials are considered by F.I.S.H. to be point source in origin.

Persistent, toxic chemicals, such as PCBs, kepone, heavy metals, and dioxin, usually originating from industrial or municipal sources, have been and continue to be responsible for some of the most serious problems affecting fish and fisheries.

- Fish populations and fisheries from the Great Lakes to the James River in Virginia, Long Island Sound, and Puget Sound have been affected seriously by chemical pollution.
- Fish are sensitive to minute quantities of these chemicals, which may affect their reproduction or jeopardize the health of individual fishes.
- Many fish are able to concentrate toxic materials in their tissues by a process of bioaccumulation and as a consequence become a source of health risk to humans who consume them.
- Pollution of aquatic habitats has required the closure of commercial striped bass fishing off New York, Rhode Island, and Connecticut; it has resulted in 38 states issuing sport fish consumption advisories affecting at

least one body of water in each state, and widespread consumption advisoriesthroughout the Great Lakes system. (Consumption advisories recommend a limitation —or in extreme cases, the suspension— of human consumption of fish taken from the affected body of water.)

Conventional pollutants, such as dissolved solids and fecal bacteria, and non-conventional pollutants, like nitrogen and phosphorous compounds, affect fish adversely and are an increasing problem because of population growth in urban areas. These become rich sources of pollution from the use of phosphorous-based detergents and various fertilizers. Estuaries— important habitats for virtually all marine fishes during some time in their life cycles— are particularly vulnerable to these classes of pollutants.

Ocean dumping has contributed to the steady degradation of marine water quality for decades, in spite of a mandatory prohibition which was to begin in 1981 and which has now been set forward until 1992.

o Nine local and regional municipalities in the New York City area still dump about 8 million tons of sewage sludge containing heavy metals and a wide variety of toxic compounds in a dump site off New York City. Ocean currents in the area of the site, more than 100 miles offshore, may bring pollution from these materials to fish habitats throughout the mid-Atlantic region. Even though current law provides that penalties will be assessed against those municipalities continuing to dump at the end of 1991, New York City officials have said they will not be able to comply with the law until the end of this century, if then.

B. Non-point Sources. These are the complex and diffuse pathways through which pollutants are washed from the surface of the land or infiltrate through the soil into groundwater which later enters streams and lakes. These pollutants originate in runoff from agricultural land, and from streets, parking lots and construction sites.

Pollutants affecting fish and fisheries include sediment, nitrogen, phosphorous, and pesticides. These affect fish in streams, rivers, lakes and estuaries, where they may interfere with spawning, prove toxic to individual fishes, and may lead to situations of oxygen depletion.

- A survey conducted by the Environmental Protection Agency in 1984 revealed that officials of 36 states considered non-point pollution to be a major water quality problem.
- Non-point source pollution is recognized as a major factor in the steady deterioration of the quality of the Chesapeake Bay. Pollution originating from sources many miles from the Bay has contributed to oxygen depletion and other problems affecting fish important to sport anglers and commercial fishermen, to the extent that pollution is considered to be a key factor in the depletion of these once abundant fish resources.
- Parts of San Francisco Bay and Massachusetts Bay also are affected by problems of oxygen depletion identified with non-point source pollution.

RECOMMENDATIONS FOR REDUCING WATER POLLUTION

F.I.S.H. believes prompt action must be taken to assure the improvement of water quality if the future demand for fish for human food and opportunities for sport fishing is to be met. F.I.S.H. endorses the following key finding of a recent OTA study of marine and estuarine waters: "In the absence of additional measures to protect our marine waters, the next few decades will witness new or continued degradation in many estuaries and coastal waters around the country (including some that exhibited past improvements . . . ." F.I.S.H. believes this observation is applicable to all waters of the U.S. As a result F.I.S.H. is delighted to support S. 587-588 and S. 1178-1179 as a means to strengthen and define the coordinated implementation of the Clean Water Act and to foster better coordination of marine and estuarine research among all participants.

F.I.S.H. is especially pleased to note Section 15 of S. 1179 which requires a comprehensive study of and report concerning the policies, programs, and activities of each federal agency that may result in the degradation of the marine environment. In addition to applauding a detailed analysis of federal agency impacts and proposed remedial actions, F.I.S.H. endorses such a "management audit" proposing legislation to achieve conformance with the Act. A suggestion for improvement is to expand the study to address all federal agency actions affecting the marine environment. Such an expansion would clearly document the duplicative "beneficial" federal agency programs that compete with each other for scarce appropriations--often to the detriment of the entire federal effort.

While endorsing the strengthening of the Clean Water Act, F.I.S.H. emphasizes its conviction that existing legislation is adequate to assure sharp improvements in the quality of the nation's waters --inland and marine. The laws are in place, but the execution of the requirements of the statutes is deficient. There is not enough emphasis given to enforcing existing laws. The nation's leaders --including the Congress, the Administration, and most state officials-- do not exhibit the commitment necessary to make the laws work.

F.I.S.H. urges:

- That Clean Water Act regulations be enforced vigorously;
- That the Administration take the initiative --and the Congress support that action-- to fund the Clean Water Act at maximum authorized levels, or $18 billion through FY 1994;
- That the present non-point source provisions of the Clean Water Act and the soil erosion control provisions of the 1985 Farm Act be implemented fully with Best Management Practices required;
- That the health of fish populations be increasingly used to measure the attainment of water quality standards established under the Clean Water Act.
- That EPA use its existing resources to insure the health of fish and prevent bioaccumulation of toxins in aquatic organisms;
- The EPA's industrial and municipal waste pretreatment requirements be enforced.

Fish and fishery resources are a neglected resource offering the potential for important economic advantage, a source of healthful and abundant food for humans, and a source of recreational opportunity for all citizens. The health of fish resources reflects the fundamental quality of the world's waters, including the oceans, and F.I.S.H. is convinced that strong, effective actions to protect the aquatic resources of the U.S. must be taken now if this treasure is to be maintained for future generations.

COUNTY OF SUFFOLK

OFFICE OF THE COUNTY EXECUTIVE

PATRICK G. HALPIN
COUNTY EXECUTIVE

June 23, 1989

The Honorable George J. Mitchell
176 Russell Senate Office Building
Washington, D.C. 20510

Dear Senator Mitchell:

I am writing to express my strong support of your legislation, S. 587, The Marine Research Center Act.

As you may know, the Long Island regional economy was devastated by many horrible environmental tragedies last summer, including infectious wastes and "Brown Tide." Our fishing catch was reported to be the lowest ever and our tourism industry was equally decimated. The total loss to Long Island was $1.4 billion.

As a result, your legislation is of vital importance to the preservation of Long Island seas and waterways and those of the other designated areas as well.

Suffolk County is fortunate to be the site of the State University of New York at Stony Brook, which is a national leader in marine research. I believe the university's resources would enormously enhance the national program that is envisioned in S.587.

I have written to Senator Lautenberg, Chairman of the subcommittee, Superfund Ocean and Water Protection, to express my utmost support of S. 587 and my desire to testify at the soon to be scheduled hearings.

Your efforts in this issue are greatly appreciated. Please do not hesitate to contact me, as I am eager to assist in any capacity.

Thank you for your consideration.

Sincerely,

PATRICK G. HALPIN
Suffolk County Executive

PGH:db

To: U.S. Senate Subcommittees on:
-Superfund Ocean and Water Protection
-Environmental Protection

From: Charlotte Todd, Chariperson, Cape May County Chamber of Commerce Environmental Affairs Committee
Date: July 12, 1989
Regarding: Comprehensive Ocean Assessment and Strategy Act Bill - S.1178.

We are pleased to have the opportunity to comment on the C.O.A.S.T. legislation for Mr. Mitchell and Mr. Lautenberg, Bills 1178 and 1179 respectively.

Certainly there is growing evidence that the American public must be involved in helping to keep the coastal waters safe and clean. When Governor Kean of New Jersey addressed a Rutgers University Conference during the Fall of 1988 on "The Future of New Jersey Coast", these salient points remain:

1. "We have 126 coastal towns and cities with vastly different standards for non-point source pollution and the permitting processes for building regulations.

2. The coastal permitting agency, C.A.F.R.A. has too many loopholes. Among these requirements for adequate drinking water supplies and sewage capacity disposal are glaringly omitted.

3. The time has come to say enough to uncontrolled growth along the New Jersey shore."

In perspective there appears to be a concerted effort on the part of the American public to utilize all available space within the coastal regions of the U.S. The efforts are relentless and in our community valuable open space is being encroached upon by developers. The time has come to stop fooling around and we think there is a need to zone or buy outright the remaining coastline.

In addition to updating and strengthening current legislation, we appreciate the opportunity to demonstrate our concerns about the coastal environment.

Regarding S. 1178

TITLE I -- WATER QUALITY PROTECTION PROGRAMS

Section 101: National Estuary Program -- Page 6, line 14 -- We would appreciate not only the Governor of any state nominating an estuary or coastal water body but citizen participation in this nominating process be allowed. The lands to be preserved should not depend heavily on the politics of an area but on the importance of the estuary to be identified.

Section 102: Point Source Discharges to Coastal Waters -- Page 20, line 11 -- It is not necessary that proposed new discharges be given permission to be discharged into a water body. Why should any increases in pollution be given approval?

Section 103: Nonpoint Source Pollution Control -- Page 22-23, lines 24,25,1,2,3 -- We disagree that National Flood Insurance Act be provided for any new structure located in a flood plain. The practice of issuing policies for construction in the coastal high-hazard zone should be discontinued. Building in the high-hazard zone places the building, inhabitant, and the environment at grave risk, and should not be underwritten by the federal taxpayer.

Page 23, line 7 - National Coastal Registry. Not only should the property owner provide basic information concerning the property's environmental sensitivity, but comments should be received from local and state environmental commissions and agencies.

Section 104: Marine Sanitation Devices -- Page 26, line 19 -- The availability of adequate facilities for safe and sanitary removal and the treatment of sewage of from vessels operating on coastal waters is almost nonexistent within the State of New Jersey. Of the 350 number of marinas, it is estimated that only 32 of them have any pumpout facilities.

Section 105: Marine Combined Sewer Overflows -- Page 32, line 14 -- With communities who already have separated storm water sewers and sanitary sewers a great effort must now go into reclaiming as much water from the sanitary sewer system as possible by filtering it back into the ground water system. Many coastal communities are experiencing salt water intrusion into their aquifers. All attempts should be made to eliminate our reliance on water as a carrier of human waste.

Section 106: Marine Water Quality and Sediment Quality Standards -- Page 37, line 7 -- We are in agreement that stringent protective standards be adopted by the State. We disagree with line 11 through 23 which enables a Governor's petition to lower the numerical standard. These standards should be established for scientific reasons and not political.

Section 107: Ocean Discharge Criteria -- Page 38, line 18 - Discharge into the ocean in the past has not aided the indigenous population of fish, shellfish, and wildlife. Note that the New Jersey Department of Environmental Protection advisories limit the consumption of certain fish including; bluefish, stripped bass, and white perch, to mention a few. In certain areas clamming beds and back creeks are restricted.

TITLE II -- MARINE SEDIMENT CONTAMINATION

Section 202: Marine Sediment Contamination -- Page 43, line 16 -- At what time of year will minimal adverse impact on aquatic resources be less significant? Dredging at any time of the year results in contaminated sediments being resuspended into the water column and food chain. Bottom feeding fish and tiny microorganisms on which the fish feed will be contaminated. For example, in the summer of 1987 Cape May City Harbor was closed by the public health department and posted; "No fishing and no swimming" due to dredging operations.

TITLE III -- OTHER PROVISIONS

Section 301: Study of Air Disposition -- Page 50, line 20 -- Coastal waters of the United States are receiving large inputs of nutrients, particularly nitrogen, which causes excessive growth of algae, loss of oxygen, decreased light penetration and the long term decline of marine life. Nitrate disposition is a known component of acid rain. The Federal Government should adopt regulations for those known sources which will create the emissions of nitrogen oxides.

Charlotte Todd

To: U.S. Senate Subcommittees on:
-Superfund, Ocean and Water Protection
-Environmental Protection
From: Charlotte Todd, Chairperson, Cape May County Chamber of Commerce Environmental Affairs Committee
Date: July 12, 1989
Regarding: Comprehensive Ocean Assessment and Strategy Act Bill - S.1179.

Section 6 - Marine Environment Toxics Release Inventory Assessment and Strategy

Page 10, line 15 -- In addition to the administrator preparing and submitting the toxic inventory, input should also be sought from the scientific community in the inventory preparation and monitoring.

Section 7 - Marine Quality Criteria and Standards

Page 12, line 1 -- In order to establish programs to reduce the amounts of toxic chemicals generated by industries identified in this Assessment, funding must be the key. According to an O.T.A. Report, September, 1986, "Over 99% of federal and state spending is devoted to controlling pollution. Less than 1% is spent to reduce the generation of waste."

Thus, under Section 17, Page 36, line 15 -- authorization would be in the amount of grants to any state shall not exceed 75% of the cost of the program and the non-Federal share of such costs may not be provided from any Federal source.

Page 13, line 6 -- The Administrator shall review and revise existing criteria or develop new stricter criteria for water. . . . The addition of stricter is critical.

Section 11 - Pretreatment Requirements

Page 25, line 22 -- When the Administrator for the state or the local government as the case may be . . . The addition of local government is important.

Page 26, line 5 -- We are in complete agreement that pretreatment programs are the most critical to prevent pollutants which would contribute to the degradation of the ocean waters. Examine the case study in point; Allied Signal Corporation was given E.P.A. approval to dump hydrochloride acid into the ocean for the last 20 years. The acid was diluted with fresh water. However, one need only look back at a Chemistry 101 course to recall that neutralization, not dilution of a hydrochloric acid is the recommended procedure. Furthermore, this process should have been carried out on site and not at sea, where the concentration of the acid and the PH level of the sea water are questionable. Has anyone even heard of sodium hydroxide as a neutralization agent? The solution to pollution is not dilution!

Section 13 - Marine Monitoring, Research and Studies

Page 30, line 2 -- And companion legislation must be adopted which would determine that a national recycling policy be established and then all recyclables must be recycled and all remaining items must be made biodegradable.- Also the Federal government should show support for the fledgling recycling industries through price supports for glass, aluminum and paper. Government has given price support to raw products. We think equivalent treatment for the recycling industry is necessary and timely!

Page 31, line 3 -- the Secretary of Health and Human Services, documented studies by the scientific communities shall undertake a study . . . The addition of input by the scientific communities is important.

Section 15 - Federal Agency Responsibilities

Page 35, line 3 -- If the Agency finds that there is no practical alternative consistent with the law then the Agency shall have the right to petition Congress in the law to minimize the potential adverse effects in the marine environment.

Thank you for inviting comments on the these bills. We are a community who is committed to taking care of our remaining resources. The custodial planetary view is that actually we did not inherit the land from our fathers, but we are borrowing it from our children. It is up to all of us to provide the necessary legislation and the enforcement of that legislation to ensure that our encroachment into the natural world extends with great restraint.

Charlotte Todd

II

101st CONGRESS
1st Session

S. 587

To amend the Marine Protection, Research, and Sanctuaries Act to protect marine and near-shore coastal waters through establishment of regional marine research programs.

IN THE SENATE OF THE UNITED STATES

March 15 (legislative day, January 3), 1989

Mr. Mitchell (for himself, Mr. Chafee, Mr. Lautenberg, Mr. Graham, Mr. Bentsen, Mr. Moynihan, Mr. Cranston, Mr. Sanford, Ms. Mikulski, Mr. Inouye, Mr. Lieberman, Mr. D'Amato, Mr. Warner, Mr. Cohen, Mr. Bradley, Mr. Sarbanes, Mr. Dodd, Mr. Matsunaga, and Mr. Breaux) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To amend the Marine Protection, Research, and Sanctuaries Act to protect marine and near-shore coastal waters through establishment of regional marine research programs.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

Section 1. Title.—This Act may be cited as the "Marine Research Act of 1989".

AMENDMENT TO THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT

SEC. 2. (a) TABLE OF CONTENTS.—

Sec. 501. Findings.
Sec. 502. Purpose.
Sec. 503. Definitions.
Sec. 504. General authority.
Sec. 505. Regional research plans.
Sec. 506. Research, support, and equipment grants.
Sec. 507. Monitoring and regional assessment.
Sec. 508. Regional Marine Research Oversight Board.
Sec. 509. Authorizations.

(b) AMENDMENT.—The Marine Protection, Research, and Sanctuaries Act is amended by adding at the end thereof the following new title:

"TITLE V—REGIONAL MARINE RESEARCH PROGRAMS

"FINDINGS

"SEC. 501. FINDINGS.—The Congress finds that—

"(a) the Nation's marine and coastal waters are a resource of tremendous value;

"(b) marine and coastal waters, including estuaries, are vital and productive natural ecosystems;

"(c) marine and coastal waters support commercial fisheries with an estimated value of over $5,500,000,000 per year, and recreational fisheries with an estimated value of over $7,500,000,000 per year;

"(d) marine and coastal waters support extensive recreational activities and related support services;

"(e) maintenance and protection of the environmental quality of the Nation's marine and coastal waters is essential to the commercial and recreational activities they support;

"(f) recent studies and reports provide evidence of growing threats to the environmental quality and ecological integrity of marine and coastal waters;

"(g) a report by the Congressional Office of Technology Assessment found that the overall health of marine and coastal waters is declining or threatened;

"(h) studies by the Environmental Protection Agency and the National Oceanic and Atmospheric Administration have identified unexpectedly high levels of contaminants in a number of coastal waters and sediments;

"(i) expanded and improved research and monitoring of marine and coastal waters is needed to gain a more complete understanding of these ecosystems, how they function naturally, and how human activities may be affecting them;

"(j) ongoing changes in world climate will alter regional weather and oceanic processes in ways which will affect the distribution and abundance of marine organisms;

"(k) there is a need to develop marine and coastal research programs which take a comprehensive approach to marine ecosystems in the various coastal and marine regions of the Nation;

"(l) there is a need to improve the extent of coordination among various marine and coastal research activities at the regional level and provide for long-range planning of research and related projects;

"(m) significant improvements in marine and coastal research can be accomplished through expansion and support of research at the regional level;

"(n) there is a need for sufficient and sustained Federal support for research and monitoring to protect the Nation's marine and coastal environment;

"(o) there is a need for comprehensive and periodic reports to the Congress on conditions and trends in marine and coastal environmental quality, research needs, and response programs; and

"(p) the results of marine and coastal research are valuable to developing and implementing marine and coastal environmental protection programs at the Federal, State, regional, and local levels.

"PURPOSE

"SEC. 502. The purposes of this title are to—

"(a) establish regional marine research programs to protect the Nation's marine and coastal environment;

"(b) provide sufficient and sustained funding for these regional programs to develop comprehensive, long-range research plans, and coordinate and support marine and coastal research and related activities;

"(c) establish within the Federal Government the capability to provide effective oversight of regional marine research; and

"(d) provide for periodic, comprehensive reports to Congress concerning conditions, trends, research needs, and response programs in the Nation's marine environment.

"DEFINITIONS

"SEC. 503. For purposes of this title—

"(a) the term 'Board' means the Regional Marine Research Oversight Board established pursuant to section 508 of this title;

"(b) the term 'region' means a Marine Research Region designated in section 504(f) of this title;

"(c) the term 'Federal agency' means any department, agency, or other instrumentality of the Federal Government, any independent agency or establishment of the Federal Government including any Government corporation;

"(d) the term 'State' means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Trust Territory of the Pacific Islands;

"(e) the term 'marine and coastal waters' means all waters seaward of the head of tide, including estuaries, near-shore coastal waters, and off-shore waters;

"(f) the term 'local government' means any city, town, borough, county, parish, district, or other public body which is a political subdivision of a State and which is created pursuant to State law; and

"(g) the term 'nonprofit organization' means any organization, association, or institution described in section 501(c)(3) of the Internal Revenue Code of 1954 which is exempt from taxation pursuant to the provisions of section 501(a) of such Code.

"REGIONAL MARINE RESEARCH PROGRAMS

"SEC. 504. (a) GENERAL AUTHORITY.—There is authorized to be established within each region, as defined under subsection (f), a regional marine research program.

"(b) PURPOSES.—Regional marine research programs established pursuant to this section are intended to—

"(1) set overall goals for an integrated, long-term program of research and monitoring of marine and coastal environmental quality in the region;

"(2) develop comprehensive, long-range plans which identify the specific needs and priorities of research and monitoring activities and projects;

"(3) assure coordination of research among State agencies and other organizations involved in marine research in the region;

"(4) monitor environmental quality conditions of marine and coastal waters and assess the impacts of proposed activities in these waters;

"(5) provide a forum for review and comment on research plans from affected user and interest groups, such as commercial fishermen, other marine industries, and environmental organizations; and

"(6) provide a forum for coordinating research among research institutions, with other regions and with neighboring countries; and

"(7) make public reports on the environmental quality conditions in the region;

"(8) analyze and interpret research data and information at the request of the relevant State and local agencies in the region for their application in environmental protection programs; and

"(9) make such scientific recommendations to local, State, and Federal agencies on design of effective programs to address identified problems as may be necessary.

"(c) AUTHORITIES.—Each regional marine research program shall be authorized to—

"(1) support basic and applied research, investigations, monitoring, and assessment activities through its member organizations and agencies in the estuarine, coastal, and offshore environments of the region;

"(2) cooperate with Federal agencies, with States and with local government entities, interstate and regional agencies, other public agencies and authorities, nonprofit institutions and organizations, or other persons, in the preparation and support of marine research in the region;

"(3) enter into contracts, cooperative agreements or grants to member organizations, and to other State and local governmental entities, other public agencies or institutions, and nonprofit institutions and organizations for purposes of carrying out the provisions of this Act;

"(4) collect and make available through publications and other appropriate means, the results of, and other information pertaining to, the research conducted in the region;

"(5) support development of effective and practical methods and techniques for the detection and assessment of contamination in the marine environment;

"(6) hire staff and equip them as may be necessary to carry out the provisions of this Act, including the ownership and operation of research vessels and construction of necessary vessel-related support structures;

"(7) call conferences on regional marine research and assessment issues, giving opportunity for interested persons to be heard and present papers at such conferences;

"(8) support, in consultation with the Department of State, joint marine research projects with foreign nations;

"(9) utilize facilities and personnel of existing Federal agencies, including scientific laboratories and research facilities;

"(10) accept, and for all general purposes of this Act, utilize funds from other sources, including but not limited to State and local funds, university funds, and donations;

"(11) accept donations of equipment if such equipment benefits regional marine research programs, with appropriate tax deductions available; and

"(12) acquire secret processes, inventions, patent applications, patents, licenses, and property rights, by purchase, license, lease, or donation.

"(d) AREAS OF INVESTIGATION.—In carrying out the purposes and authorities of this section, regional research programs may support or assist research, investigations, studies, surveys, or demonstrations with respect to, but not limited to—

"(1) baseline assessment of marine environmental quality, including chemical, physical, and biological indicators of environmental quality;

"(2) basic oceanographic and biological conditions and processes;

"(3) effects or potential effects of contaminants, including nutrients, toxic chemicals and heavy metals, on the environment, including marine and aquatic organisms;

"(4) effects of modification of habitats, including coastal wetlands, seagrass beds and reefs, on the environment, including marine organisms;

"(5) inventory of pollutant sources and pollutant discharges into the coastal environment;

"(6) transport, dispersion, transformation, and fate and effect of contaminants in the marine environment;

"(7) marine and estuarine habitat assessment, protection, and restoration;

"(8) methods and techniques for modeling environmental quality conditions and trends;

"(9) methods and techniques for sampling of water, sediment, marine and aquatic organisms, and demonstration of such methods and techniques;

"(10) the effects on human health and the environment of contaminants or combinations of contaminants at various levels, whether natural or anthropogenic, that are found in the environment;

"(11) assessment of potential effects of major coastal and offshore development projects in the region;

"(12) assessment and monitoring of the effects of climate change on marine resources in the region; and

"(13) analysis and interpretation of research data for the benefit of State and local environmental protection and resource management agencies in the region.

"(e) CREATION OF REGIONAL PROGRAMS.—(1) The Governors of a majority of the States in a region, as defined in subsection (f), may submit for approval to the Regional Marine Research Oversight Board a combined, interstate proposal for a regional marine research program.

"(2) Proposals for establishment of a regional marine research program shall—

"(A) identify the goals and objectives of the program;

"(B) identify the organizational structure and operating procedures of the program;

"(C) identify the research organizations within the region that will participate in the program, including State agencies, research laboratories and organizations (including marine research laboratories and organizations operated within the region by Federal agencies and national laboratories with marine research programs), academic institutions, national laboratories with established oceanographic programs, and others;

"(D) identify the research capabilities and experience of the member organizations and how such capabilities and experience will be coordinated and maintained; and

"(E) provide for a Board of Directors, which shall include at all times not less than one member who is a Director of a Sea Grant Program of a State in the region, to oversee the administration and management of the regional research program;

"(F) provide for the position of Executive Director of the regional research program who shall administer and manage the program;

"(G) provide for professional and administrative staff support as needed to carry out the authorities, goals and objectives of the regional research program;

"(H) to the fullest extent practicable, make use of existing administrative and related resources and facilities, including the resources and facilities of the Sea Grant Program, in order to assure the most cost-effective management and implementation of the authorities and activities of the research program; and

"(I) provide for a Research Advisory Group, to include representatives from affected user and interest groups, including the commercial fishing industry, other marine industries, and environmental organizations, to advise the Board of Directors in the conduct of authorized activities.

"(3) Proposals for a regional marine research program shall be developed by a Regional Marine Research Organizing Committee which shall consist of the Director of the Sea Grant Program in each State in the region. The Organizing Committee shall coordinate and consult with agencies, institutions, and organizations which are expected to participate in the research program and with interest groups expected to participate in the Research Advisory Group in the development of the proposal.

"(4) Within ninety days of receipt of a proposal, the Board shall hold a public hearing in the region to hear comments on the proposal.

"(5) Within one hundred and eighty days after receipt of a proposal, the Board shall approve or disapprove the proposal on consideration of the following criteria—

"(A) inclusion as participating members of the program or other provision or mechanism for full coordination and cooperation with appropriate State agencies, marine research organizations or institutions, relevant national laboratories, and universities with marine programs in the region;

"(B) demonstrated capability in sufficient disciplines to successfully mount a multidisciplinary research program;

"(C) sufficient resources, including laboratory, library, computer, and support facilities;

"(D) a commitment from the member institutions to the support and participate in the regional marine research program; and

"(E) establishment of an Advisory Group pursuant to paragraph (2)(I), and commitment to adequate procedures for effective consultation with such group.

"(6) In the case of disapproval of a proposal, the Board shall notify the Governors of the submitting States in writing, stating in detail the revisions or modifications necessary to obtain approval of the proposal. The Governors of the interested States may, not later than ninety days following such notification, submit such revisions and modifications as they deem appropriate. The Board shall approve or disapprove the revised proposal within ninety days of receipt.

"(f) MARINE RESEARCH REGIONS.—For purposes of this Act, marine research regions are defined as follows:

"(1) Gulf of Maine region, comprised of the marine and near-shore coastal waters off the States of Maine, New Hampshire, and Massachusetts (north of Cape Cod);

"(2) greater New York bight region, from south of Cape Cod to Cape May, comprised of the marine and coastal waters off the States of Massachusetts, Rhode Island, Connecticut, New York, and New Jersey;

"(3) mid-Atlantic region, from Cape May, New Jersey, to Cape Lookout, comprised of the marine and coastal waters off the States of New Jersey, Delaware, Maryland, Virginia, and North Carolina;

"(4) South Atlantic bight region, from Cape Lookout to the Florida Keys, comprised of the marine and coastal waters off the States of North Carolina, South Carolina, Georgia, and Florida (Atlantic coast);

"(5) tropical region, comprised of the marine and coastal waters off Puerto Rico and the United States Virgin Islands (and to provide for broader international research coordination, representatives from the nations of the Caribbean region may serve as ex officio members of the program of this region);

"(6) Gulf of Mexico region, comprised of the marine and coastal waters off the States of Florida (Gulf coast), Alabama, Mississippi, Louisiana, and Texas;

"(7) California region, comprised of the marine and coastal waters off the State of California from Point Reyes south;

"(8) North Pacific region, from Point Reyes to the Canadian border, comprised of the marine and coastal waters off the States of California, Oregon, and Washington;

"(9) Gulf of Alaska, Bering and Arctic Seas region, comprised of the marine and near-shore coastal waters off the State of Alaska; and

"(10) insular Pacific region, comprised of the marine and coastal waters off the State of Hawaii, Guam, American Samoa, and the Northern Mariana Islands.

"REGIONAL RESEARCH PLANS

"SEC. 505. (a) REGIONAL RESEARCH PLANS.—(1) Each regional marine research program, approved under section 404 shall develop a three-year marine research and assessment plan for the region.

"(2) In development of research plans, the Board of Directors of the regional research program shall review and consider findings and recommendations of the national plan developed pursuant to the National Ocean Pollution Planning Act of 1978.

"(b) CONTENTS OF PLAN.—Such marine research plan shall include—

"(1) an overview of the environmental quality conditions in the near-shore coastal and marine waters of the region and expected trends in these conditions;

"(2) a description of the research and assessment needs, goals, and priorities in the region over the upcoming ten-year period with emphasis on the upcoming three-to-five year period;

"(3) a comprehensive inventory and description of all federally funded marine research and assessment activities expected to be conducted in the region during the three-year term of the research plan, including, but not limited to, projects funded under—

"(A) this Act;

"(B) the National Sea Grant Program;

"(C) section 320 of the Federal Water Pollution Control Act as amended;

"(D) the Fish and Wildlife Act of 1956; and

"(E) the Magnuson Fishery Conservation and Management Act of 1976.

"(4) an inventory and description of other research and assessment projects expected to be funded by public and private research organizations in the region;

"(5) a general description of research and assessment projects, including monitoring and assessment activities pursuant to section 507(a)(1), to be given priority for funding under section 506 of this Act in the three-year period covered by the plan, including the objectives of such projects and the approximate schedule, funding level, and products of such projects.

"(6) to the extent practicable, review of research and assessment projects which are addressing issues common to neighboring regions and discussion of coordination of these projects; and

"(7) an inventory of supplies and equipment used commonly for research projects in the region.

"(c) PLAN REVIEW AND APPROVAL.—(1) The research plan shall be submitted by the Board of Directors of the regional program to the Regional Marine Research Oversight Board for review and approval.

"(2) The Research Advisory Group established pursuant to section 504(e)(2)(I) shall have an opportunity to review and comment on the research plan.

"(3) In review of research plans, the Board shall consider the degree to which the plan addresses the elements identified in subsection (b) of this section, any comments of the Research Advisory Group, and the past performance of the regional program in implementation of previous plans.

"(4) The Board shall approve or disapprove the research plan within one hundred and twenty days of receipt.

"(5) In the case of disapproval of a research plan, the Board shall notify the Board of Directors in writing, stating in detail the revisions or modifications necessary to obtain approval of the plan. The Board of Directors shall, not later than ninety days after such notification, submit such revisions and modifications as they deem appropriate. The Board shall approve or disapprove the revised plan within ninety days of receipt.

"(d) PLAN REVISION.—The research plan shall be revised and updated to reflect changing conditions every three years and resubmitted to the Board for review and approval under this section.

"RESEARCH, SUPPORT, AND EQUIPMENT GRANTS

"SEC. 506. (a) SUPPORT GRANTS.—(1) A regional marine research program for which a proposal has been approved pursuant to section 504, may submit to the Board an application for a support grant on an annual basis.

"(2) The application may provide for funding of basic functions of the program including—

"(A) cost of facilities, offices, and related equipment;

"(B) salaries and expenses of staff and other personnel services;

"(C) reasonable maintenance costs of equipment, including vessels, as determined by the Board; and

"(D) other overhead costs including costs of publications, development of research plans, and conduct of scientific and related meetings and seminars.

"(3) The application shall be for a period of a fiscal year and shall be in such form as may be required by the Board.

"(4) The Board shall approve or disapprove an application pursuant to this subsection within ninety days of receipt.

"(b) RESEARCH GRANTS.—(1) A regional marine research program for which a research plan has been approved pursuant to section 505 may submit to the Board an application for funding of research and assessment projects, in an amount to be specified by the Board and consistant with this

Act, to support implementation of the approved research plan on an annual basis.

"(2) Organizations and agencies identified pursuant to section 504(e)(2)(C) may submit to the Board of Directors of the regional marine research program proposals for specific research and assessment projects.

"(3) Proposals submitted pursuant to paragraph (2) shall include—

"(A) identification of the responsible organization and principal investigator(s);

"(B) a budget statement and description of equipment needs;

"(C) a schedule of milestones, interim products, and final products;

"(D) a description of the final products of the research or assessment project;

"(E) a description of the relationship of the proposed project to the goals, objectives, and priorities of the research plan for the region and the relationship to other projects to be conducted in the region; and

"(F) any other information as may be required by the Board of Directors of the regional research program or the Regional Marine Research Oversight Board.

"(4) Proposals submitted pursuant to paragraph (2) shall be provided to the Regional Marine Research Oversight Board which shall provide for the peer review of each research or assessment project. Such peer review shall be conducted promptly and shall include review of each project by not less than two research scientists from a region other than the region in which the project is proposed. Findings of the peer review shall be provided to the Board of Directors of the regional research program submitting the proposal.

"(5) In selection of proposed projects for inclusion in the application for funding under this subsection, the Board of Directors shall consider—

"(A) the views and comments of the organizations and agencies identified pursuant to section 504(e)(2)(C);

"(B) the views and comments of the Research Advisory Group established pursuant to section 504(e)(2)(I);

"(C) the findings of the peer review process provided for in paragraph (4); and

"(D) the extent to which the proposed project is consistent with the goals, objectives, and priorities identified in the research plan.

"(6) Projects designed to extend beyond a one-year period shall include a full description of the entire project pursuant to paragraph (3) at the time of submittal and shall be reviewed pursuant to paragraph (4) subsequent to initial submittal only.

"(7) The Regional Marine Research Oversight Board shall review grant applications submitted pursuant to this section and shall approve or disapprove the application within ninety days of receipt.

"(c) EQUIPMENT SUPPORT.—(1) The Board of Directors of any research program with an approved research plan pursuant to section 505 of this Act may submit to the Board an application to purchase equipment necessary for the research provided for in the approved research plan and funded under subsection (b).

"(2) Equipment eligible for support under this section includes, but is not limited to—

"(A) monitoring and sampling equipment;

"(B) computer hardware or software;

"(C) scientific measurement and analytic equipment; and

"(D) necessary vessels and related support craft.

"(3) In review and approval of applications under subsection (2), the Board shall establish that there is—

"(A) a clearly demonstrated need for the equipment in the region to support identified research projects; and

"(B) adequate provision for maintenance and full utilization of the equipment, including loaning of equipment to organizations participating in another marine research center.

"(4) In review and approval of applications under paragraph (2)(D), the Board shall consult with the Federal Fleet Coordinating Council and the University Oceanographic Laboratory System (UNOLS) to determine the need for vessels or support craft.

"(5) The Board of Directors of each program shall hold title to equipment purchased pursuant to this section, shall report annually to the Board on the status and disposition of any equipment funded under this subsection, and shall give notice of ninety days prior to any sale or other disposition of such equipment.

"(d) REPORTING.—Any regional marine research program that receives a grant under subsection (b) of this section shall report to the Board not later than eighteen months after award of the grant on activities pursuant to this subsection. Such report shall include narrative summaries and technical data in such form as the Board may require.

"(e) MANAGEMENT.—For administrative purposes, grant funds pursuant to this section shall be managed by the National Oceanic and Atmospheric Administration.

“MONITORING AND REGIONAL ASSESSMENT

“SEC. 507. (a) MONITORING AND ASSESSMENT.—Each regional marine research program established in accordance with section 504 and receiving funds pursuant to sections 506 and 509 of this Act shall—

“(1) consistent with the research plan developed under section 505, support baseline monitoring of fundamental marine environmental conditions in the region, in accordance with criteria, measurement standards, and quality assurance techniques required by the Board; and

“(2) prepare periodic reports providing an assessment of the status of marine environmental quality and resources in the region.

“(b) REGIONAL MARINE ASSESSMENT REPORT.—(1) The regional marine assessment report mandated under this section shall—

“(A) provide an overview of environmental quality in the region using such information as is obtained pursuant to paragraph (1) of subsection (a) and such other information as is available;

“(B) describe trends in natural resource and environmental quality conditions;

"(C) summarize the findings and conclusions of projects of the research program and identify issues and research needs; and

"(D) provide recommendations for improvements in the design or implementation of Federal, State, or local programs for the protection of environmental quality in the region.

"(2) A draft of the regional marine assessment report shall be reviewed by the Research Advisory Group for their comments and input before final submission to the Board.

"(3) The regional marine assessment report shall be drafted in nontechnical style and shall be made available to the public, as well as to local, State, and Federal regulatory and management agencies. The regional marine assessment report shall be submitted to the Governors of each State in the region.

"(4) Reports under this subsection shall be submitted to the Board on a schedule to be determined by the Board. To the extent practicable, the Board shall provide for reports beginning three years after the date of establishment of each regional program and every three years thereafter.

"REGIONAL MARINE RESEARCH OVERSIGHT BOARD

"SEC. 508. (a) ESTABLISHMENT OF REGIONAL MARINE RESEARCH OVERSIGHT BOARD.—(1) There is authorized to be established a Regional Marine Research Oversight Board to oversee and coordinate the activities of the regional marine research programs authorized under section 504 of this Act.

"(2) The members of the Board shall be representatives of the following Federal agencies and institutions designated by the senior administrative official of each agency or institution—

"(A) the National Oceanic and Atmospheric Administration,

"(B) the Environmental Protection Agency,

"(C) the National Science Foundation,

"(D) the United States Fish and Wildlife Service,

"(E) the Minerals Management Service,

"(F) the United States Army Corps of Engineers,

"(G) the Department of Energy,

"(H) the United States Navy, and

"(I) the United States Geological Survey, and

"(J) the National Academy of Science.

"(3) The representative of the National Oceanic and Atmospheric Administration shall serve as Chair of the Board.

"(4) The Board shall organize its internal structure and functions as it deems necessary to best fulfill its responsibilities.

"(b) FUNCTIONS AND AUTHORITIES.—(1) The Board shall be responsible for the following—

"(A) review and approval of proposals for regional marine research programs, including conducting a public hearing in the region, in accordance with the provisions of section 504;

"(B) review and approval of the three-year research plans submitted by regional marine research programs, in accordance with section 505; and

"(C) approval of grant applications from the regional marine research programs, in accordance with section 506.

"(2) The Board is authorized to—

"(A) hire professional and support staff to carry out the provisions of this section;

"(B) hire an Executive Director at the Senior Executive Service (SES) level;

"(C) expend funds authorized under subsection (d) as required to carry out the provisions of this section; and

"(D) make grants to the regional marine research programs, pursuant to sections 506 and 509 of this Act.

"(c) REPORT TO CONGRESS.—(1) The Board shall make periodic reports to Congress on the health of the Nation's marine and coastal waters, and on the research and assessment activities and accomplishments of the regional marine research programs.

"(2) Reports under this subsection shall be made within three years of the date of enactment and every three years thereafter.

"(d) FUNDING.—The activities of the Board shall be supported with funds available under section 509(b) of this Act.

"AUTHORIZATIONS

"SEC. 509. (a)(1) For the purpose of carrying out the activities authorized by sections 504, 505, 506, 507, and 508 of this Act there are authorized to be appropriated from general revenues or the Marine Research Trust Fund (pursuant to chapter 98, subchapter A, section 9511, United States Code) $33,000,000 per year.

"(2) Such funds shall be allocated as follows—

"(A) for the costs of the Regional Marine Research Oversight Board established pursuant to section 508 of this Act, except that not more than $1,000,000 shall be available for such purposes for any fiscal year;

"(B) for grants to regional marine research programs pursuant to section 506(a) of this Act, but only if such research program has submitted a proposal which has been approved pursuant to section 504 of this Act and each grant under this paragraph is not in excess of $500,000 per fiscal year;

"(C) for grants to support implementation of the regional research plan developed pursuant to section 505 of this Act, including research projects pursuant to section 506(b) and regional monitoring and assessment activities pursuant to section 507, but only if a research plan has been approved pursuant to section 505(c) and the aggregate amounts of grants under paragraphs (B) and (C) of this subsection to any such program for any fiscal year do not exceed $3,000,000, or $1,500,000 in the case of the Tropical region defined by section 504(f)(5), or $5,000,000 in the case of the Gulf of Mexico region defined by section 504(f)(6); and

"(D) for grants for the purchase of equipment under section 506(c) of this Act, to the extent of amounts in the Marine Research Fund which are not appropriated pursuant to paragraphs (A), (B), or (C).

"(b) In the event that funds available in the Marine Research Trust Fund are not sufficient to make grants in the full amounts provided for in this section, the Regional Marine Research Oversight Board shall give priority to grants pursuant to paragraph (A) of subsection (a)(2); shall give second priority to grants pursuant to paragraph (B) of subsection (a)(2); and shall make grants pursuant to paragraph (C) of subsection (a)(2) available on a pro rated basis.

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101st CONGRESS
1st Session

S. 588

To establish the Regional Marine Research Trust Fund, and for other purposes.

IN THE SENATE OF THE UNITED STATES

March 15 (legislative day, January 3), 1989

Mr. Mitchell (for himself, Mr. Chafee, and Mr. Lautenberg) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To establish the Regional Marine Research Trust Fund, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. REGIONAL MARINE RESEARCH TRUST FUND.

(a) Creation of Trust Fund.—There is established in the Treasury of the United States a trust fund to be known as the "Regional Marine Research Trust Fund", consisting of such amounts as may be transferred to such Trust Fund as provided in this section or credited to the Trust Fund under subsection (f).

(b) TRANSFERS TO TRUST FUND.—The Secretary of the Treasury shall transfer monthly into the Regional Marine Research Trust Fund any unobligated balance of the Offshore Oil Pollution Compensation Fund in excess of $195,000,000.

(c) APPROPRIATION OF ADDITIONAL SUMS.—There are hereby authorized to be appropriated to the Regional Marine Research Trust Fund such additional sums as may be appropriate to make the expenditures referred to in subsection (d).

(d) EXPENDITURES.—Amounts in the Regional Marine Research Trust Fund shall be available, as provided in appropriation Acts, to the Regional Marine Research Oversight Board for the purposes of making expenditures to carry out sections 504, 505, 506, 507, and 508 of the Marine Research Act of 1988, but not in excess of $33,000,000 for any fiscal year.

(e) REPORT.—It shall be the duty of the Secretary of the Treasury to hold the Regional Marine Research Trust Fund and to report to the Congress each year on the financial condition and the results of the operations of the Trust Fund during the preceding fiscal year and on the expected condition and operations of the Trust Fund during the next 5 fiscal years.

(f) INVESTMENT.—

(1) IN GENERAL.—It shall be the duty of the Secretary of the Treasury to invest such portion of the Regional Marine Research Trust Fund as is not, in the judgment of the Secretary, required to meet current withdrawals. Such investments may be made only in interest-bearing obligations of the United States. For such purpose, such obligations may be acquired—

(A) on original issue at the issue price, or

(B) by purchase of outstanding obligations at the market price.

(2) SALE OF OBLIGATIONS.—Any obligation acquired by the Trust Fund may be sold by the Secretary of the Treasury at the market price.

(3) INTEREST ON CERTAIN PROCEEDS.—The interest on, and the proceeds from the sale or redemption of, any obligations held in the Trust Fund shall be credited to and form a part of the Trust Fund.

(g) CONFORMING AMENDMENTS TO OUTER CONTINENTAL SHELF LANDS ACT AMENDMENTS OF 1978.—

(1) Section 302(c) of the Outer Continental Shelf Lands Act Amendments of 1978 (43 U.S.C. 1812(c)) is amended—

(A) by striking out "and" at the end of paragraph (2),

(B) by striking out the period at the end of paragraph (3) and inserting in lieu thereof ", and", and

(C) by inserting after paragraph (3) the following new paragraph:

"(4) transfers to the Regional Marine Research Trust Fund.".

(2) Section 302(d)(2) of the Outer Continental Shelf Lands Act Amendments of 1978 (43 U.S.C. 1812(d)(2)) is amended by striking out "not less than $100,000,000 and not more than".

(h) Effective Date.—The amendments made by this section shall take effect on the date of the enactment of this Act.

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II

101st CONGRESS
1st Session

S. 1178

To improve and expand programs for the protection of marine and coastal waters.

IN THE SENATE OF THE UNITED STATES

June 14 (legislative day, January 3), 1989

Mr. Mitchell (for himself, Mr. Lautenberg, Mr. Chafee, Mr. Moynihan, Mr. Cohen, Mr. Lieberman, Mr. D'Amato, Mr. Sarbanes, Mr. Bradley, Mr. Fowler, Mr. Dodd, Mr. Graham, and Mr. Pell) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To improve and expand programs for the protection of marine and coastal waters.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE AND TABLE OF CONTENTS

Section 1. (a) Title.—This Act may be cited as the "Marine Protection Act of 1989".

(b) Table of Contents.—

Sec. 1. Short title and table of contents.
Sec. 2. Findings.

TITLE I—WATER QUALITY PROTECTION PROGRAMS

Sec. 101. National Estuary Program.
Sec. 102. Point source discharges to coastal waters.
Sec. 103. Nonpoint source pollution control.

Sec. 104. Marine sanitation devices.
Sec. 105. Marine combined sewer overflow.
Sec. 106. Marine water quality standards.
Sec. 107. Ocean discharge criteria.
Sec. 108. Definitions.

TITLE II—MARINE SEDIMENT CONTAMINATION

Sec. 201. Marine sediment criteria and information.
Sec. 202. Marine sediment contamination.
Sec. 203. State ocean dumping requirements.
Sec. 204. Site designation.
Sec. 205. Dredge and fill program.

TITLE III—OTHER PROVISIONS

Sec. 301. Study of air deposition.
Sec. 302. Identification of unregulated contaminants.
Sec. 303. Research of microorganisms.

FINDINGS

SEC. 2. The Congress finds that—

(A) the Nation's marine and coastal waters are a resource of tremendous value;

(B) marine and coastal waters, including estuaries, are vital and productive natural ecosystems;

(C) marine and near coastal waters support commercial and recreational fisheries with an annual value estimated at over $12 billion per year;

(D) marine and coastal waters support extensive recreational activities and related support services;

(E) maintenance and protection of the environmental quality of the Nation's marine and coastal waters is essential to the commercial and recreational activities they support;

(F) recent studies and reports provide evidence of growing threats to the environmental quality and ecological integrity of marine and coastal waters;

(G) a report by the Congressional Office of Technology Assessment found that the overall health of estuaries and coastal waters is declining or threatened;

(H) studies by the National Oceanic and Atmospheric Administration and the Environmental Protection Agency have identified unexpectedly high levels of contaminants in a number of coastal areas;

(I) expanded and improved research and monitoring of marine and estuarine ecosystems is needed to gain a more complete understanding of these ecosystems and how man's activities may be effecting them;

(J) there is a need to expand and improve pollution control requirements programs for the control of point and nonpoint sources of pollution to marine and coastal waters;

(K) there is a need to develop plans and programs for the elimination of discharges of combined stormwater and sanitary sewer overflows to coastal waters;

(L) there is a need to expand and expedite the process of setting enforceable water quality standards for coastal waters and to develop standards for coastal sediments; and

(M) there is a need to improve the management of contaminated sediments and dredge materials.

TITLE I—WATER QUALITY PROTECTION PROGRAMS

NATIONAL ESTUARY PROGRAM

SEC. 101. Section 320 of the Federal Water Pollution Control Act is amended as follows:

"**SEC. 320. NATIONAL ESTUARY PROGRAM.**

"(a) DESIGNATION OF PRIORITY ESTUARIES AND COASTAL WATERS.—

"(1) The Administrator shall, within eighteen months of the date of enactment of this Act and biennially thereafter, identify and designate, pursuant to this section, all estuaries and coastal waters experiencing a general degradation of environmental conditions and which do not support a balanced, indigenous population of shellfish, fish, and wildlife and allow for recreational activities in and on the water.

"(2) In selection of estuaries or coastal waters pursuant to paragraph (1), the Administrator shall consider—

"(A) the extent and seriousness of water quality contamination;

"(B) the presence of toxic or other contaminants in sediment and the potential for migration of such contamination to water or aquatic organisms;

"(C) the condition of aquatic life and related habitat;

"(D) the presence of threatened or endangered species; and

"(E) anticipated total increases in pollution loadings.

"(3) In support of designation of estuaries and coastal waters pursuant to paragraph (1), the Administrator shall conduct such studies, research, and assessments as are necessary and shall, at a minimum, consider—

"(A) research, assessments, or related studies of the National Oceanic and Atmospheric Administration, including the Status and Trends Program, the National Sediment Contamination Assessment, and other studies;

"(B) estuaries and coastal waterbodies listed in paragraph (4) of this subsection; and

"(C) the views and comments of interested groups and the public.

"(4) In selection of estuaries and coastal waterbodies for designation under paragraph (1) of this section, the Administrator shall consider designation of

Long Island Sound, New York and Connecticut; Narragansett Bay, Rhode Island; Buzzards Bay, Massachusetts; Casco Bay, Maine; Massachusetts Bay, Massachusetts (including Cape Cod Bay and Boston Harbor); Puget Sound, Washington; New York-New Jersey Harbor, New York and New Jersey; Delaware Bay, Delaware and New Jersey; Delaware Inland Bays, Delaware; Albemarle Sound, North Carolina; Sarasota Bay, Florida; San Francisco Bay, California; Galveston Bay, Texas; Santa Monica Bay, California; Barataria-Terrebonne Bay estuary complex, Louisiana; Indian River Lagoon, Florida; and Peconic Bay, New York.

"(5) The Governor of any State may nominate to the Administrator an estuary or coastal waterbody lying in whole or in part within that State for designation pursuant to paragraph (1) of this subsection. Following receipt of such a petition the Administrator shall evaluate the identified estuary pursuant to paragraphs (2) and (3) of this subsection and shall, within one hundred and eighty days of receipt of such petition, issue a notice in the Federal Register announcing the designation of such waterbody or the decision not to designate the waterbody, including an explanation of such action.

"(6) The Chesapeake Bay shall be treated as a coastal waterbody designated pursuant to this subsection for the purposes of subsection (b) of this section.

"(7) For the purposes of this subsection, the term "estuaries or coastal waters" refers to estuaries, bays, sounds or other distinct marine waterbodies which are associated with more than one political subdivision and which receive pollution loadings from a range of point and nonpoint sources.

"(b) SPECIAL AUTHORITIES OF THE ADMINISTRATOR.—

"(1) In the case of any estuary or coastal waterbody designated after January 1, 1989, the Administrator; or with respect to subparagraphs (A) and (B) in the case of a State authorized to issue permits under section 402 of this Act, the State, shall—

"(A) exercise authorities concerning discharges to coastal waters pursuant to section 301(q) of this Act;

"(B) notwithstanding the schedules established pursuant to section 402(p)(4) or any other provision of law, within one hundred and eighty days of designation, issue permits for any industrial and municipal discharges of stormwater to such waters, consistent with the requirements of section 402(p)(3) of this Act;

"(C) within one hundred and eighty days of designation, consider pursuant to section 404(c) of this Act, prohibiting the specification of an area designated pursuant to this section as a disposal site and denying or restricting the use of any area designated pursuant to this section as a disposal site;

"(D) exercise authorities concerning prohibition of discharges of sewage from vessels pursuant to section 312 of this Act;

"(E) require that each publicly owned treatment work discharging to such waters, regardless of the volume of such discharge of population served by the treatment works, shall develop and enforce facility specific programs for the pretreatment of industrial wastes; and

"(F) in the case of a State that does not have an approved assessment and/or management program for the affected waterbody that complies with section 319(b) of this Act, conduct an assessment and prepare a management program for the watershed of such waters within eighteen months of the date of designation.

"(c) RESEARCH AND ASSESSMENT.—(1) Upon the designation of an estuary or coastal waterbody pursuant to subsection (a), the Administrator, in cooperation with the Under Secretary and with affected States shall develop and implement—

"(A) a long-term program of monitoring to determine variations in pollutant concentrations, marine ecology, and other physical or biological environmental parameters which may affect the designated waterbody to provide the Administrator the capacity to determine the potential and actual effects of alternative management strategies and measures;

"(B) a program of ecosystem assessment assisting in the development of (i) baseline studies which determine the biological conditions in the designated waterbody and the effects of natural and anthropogenic changes, and (ii) predictive models capable of translating information on specific discharges or general pollutant loadings within the waterbody into a set of probable effects on biological conditions in such water bodies;

"(C) a comprehensive water quality and sediment sampling program for the periodic monitoring of the chemical conditions in the designated waterbody (including nutrients, chlorine, acid precipitation, dissolved oxygen, organic chemicals, metals and other toxic pollutants); after consultation with interested State, local, interstate, or international agencies;

"(D) review and analysis of all environmental sampling data presently collected from such waters; and

"(E) a program of research to identify the movements of nutrients, sediments and pollutants through designated waterbodies and the impact of nutrients, sediments, and pollutants on water quality, the ecosystem, and designated or potential uses of such waters.

(2) The Administrator may make grants to State, interstate, and regional water pollution control agencies and entities to support research monitoring, and related activities pursuant to this subsection. The amount of grants to any person under this subsection for a fiscal year shall not exceed 75 per centum of the costs of such activity and shall be made on the condition that the non-Federal share of such costs are provided from non-Federal sources.

(3) The Administrator shall provide a report of the status of research and the findings of such research to the Governor of each State in which a waterbody designated pursuant to this section is located.

"(d) MANAGEMENT CONFERENCES.—

"(1) Upon the designation of an estuary or coastal waterbody pursuant to subsection (a), or as soon thereafter as practicable, the Administrator shall convene a management conference. In any case in which the Administrator has initiated a management conference prior to January 1, 1989, the Administrator may maintain and support such management conference consistent with the requirements of this subsection.

"(2) The purposes of any management conference convened pursuant to this subsection shall be to—

"(A) assess trends in water quality, natural resources, and uses of the designated waterbody;

"(B) collect, characterize, and assess data on toxics, nutrients, and natural resources within the designated waterbody to identify the causes of environmental problems;

"(C) develop the relationship between the inplace loads and point and nonpoint loadings of pollutants to the waterbody and the potential uses of the waterbody, water quality, and natural resources;

"(D) develop a comprehensive environmental protection plan that recommends priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the designated waterbody, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in and on the waterbody and assure that the designated uses of the waterbody are protected;

"(E) develop plans for the coordinated implementation of the plan by the States as well as Federal and local agencies participating in the conference;

"(F) monitor the effectiveness of actions taken pursuant to the plan; and

"(G) review all Federal financial assistance program and Federal development project in accordance with the requirements of Executive Order 12372, as in effect on September 17, 1983, to determine whether such assistance program or project would be consistent with and further the purposes and objectives of the plan prepared under this section.

For purposes of paragraph G, such programs and projects shall not be limited to the assistance programs and development projects subject to Executive Order 12372, but may include any programs listed in the most recent Catalog of Federal Domestic Assistance which may have an effect on the purposes and objectives of the plan developed under this section.

"(3) The members of a management conference convened under this section shall include, at a minimum, the Administrator and representatives of—

"(A) each State and foreign nation located in whole or in part in the waterbody for which the conference is convened;

"(B) international, interstate, or regional agencies or entities having jurisdiction over all or a significant part of the waterbody;

"(C) each interested Federal agency, as determined appropriate by the Administrator;

"(D) local governments having jurisdiction over any land or water within the waterbody, as determined appropriate by the Administrator; and

"(E) affected industries, public and private educational institutions, and the general public, as determined appropriate by the Administrator.

"(4) In developing an environmental protection plan under this section, the management conference shall survey and utilize existing reports, data, and studies relating to the waterbody that have been developed by or made available to Federal, interstate, State, and local agencies.

"(5) The Administrator at the request of a management conference convened pursuant to this subsection is authorized to require any person whose alleged activities cause or contribute to pollution to file with it in such form as the Administrator shall require, a report based on existing data, furnishing such information as may reasonably be required as to the character, kind, and quantity of such activities and the use of facilities, management practices, or other means to prevent or reduce pollution resulting from such activities by the person filing such a report. Such report shall be made under oath and shall be filed with the Administrator within such reasonable period as the Administrator requires. Upon a showing satisfactory to the conference by the person filing such report that such report or portion thereof (other than effluent data), to which the Administrator has access under this section, if made public would divulge trade secrets or secret processes of such person, the Administrator shall consider such report or portion thereof confidential for the purposes of section 1905 of title 18 of the United States Code. If any person required to file any report under this paragraph shall fail to do so within the time fixed by the Administrator for filing the same, and such failure shall continue for thirty days after notice of such default, such person shall forfeit to the United States the sum of $1,000 for each and every day of the continuance of such failure, which forfeiture shall be payable into the Treasury of the United States, and shall be recoverable in a civil suit in the name of the United States in the district court of the United States where such person has his principal office or in any district in which he does business. The Administrator may upon application therefor remit or mitigate any forfeiture provided for under this subsection.

"(6) A management conference convened under this section shall be convened for a period not to exceed five years. Such conference may be extended by the Administrator, and if terminated after the initial period, may be reconvened by the Administrator at any time thereafter, as may be necessary to meet the requirements of this section.

"(7) Not later than one hundred and twenty days after the completion of an environmental protection plan and after providing for public review and comment, the Administrator shall approve such plan, or portions thereof, if the plan meets the requirements of this section and the affected Governor or Governors concur.

"(8) Upon approval of an environmental protection plan under this section, such plan shall be implemented. Funds authorized to be appropriated under sections 207, 319, and 607 of this Act may be used in accordance with the applicable requirements of this Act to assist States with the implementation of such plan.

"(9) The Administrator is authorized to make grants to State, interstate, and regional water pollution control agencies and entities, State coastal zone management agencies, interstate agencies, other public or nonprofit private agencies, institutions, organizations, and individuals. Grants under this subsection shall be made to pay for assisting the development of a conservation and management plan under this subsection. The amount of grants to any person (including a State, interstate, or regional agency or entity) under this subsection for a fiscal year shall not exceed 75 per centum of the total annual costs of such research and activities and shall be made on condition that the non-Federal share of such costs are provided from non-Federal sources. Any person (including a State, interstate, or regional agency or entity) that receives a grant under this paragraph shall report to the Administrator not later than eighteen months after receipt of such grant and biennially thereafter on the progress being made under this section.

"(10) The Administrator shall monitor the implementation of environmental protection plans developed pursuant to subparagraph (D) of paragraph (2) of this subsection following the termination of the management conference.

"(e) REPORT TO CONGRESS.—

"(1) The Administrator, in cooperation with the Under Secretary, shall submit to the Congress, within eighteen months of the date of enactment of this Act and biennially thereafter, a comprehensive report on the activities authorized by this section including—

"(A) a listing of priority monitoring and research needs in coastal waters;

"(B) an assessment of the state of health of the Nation's coastal waters;

"(C) a list of the estuaries and coastal waterbodies designated pursuant to subsection (a) of this section;

"(D) an evaluation of the pollution abatement measures implemented pursuant to this section;

"(E) an assessment and description of the management conferences in progress and a report on the implementation of adopted environmental protection plans;

"(F) an assessment of major obstacles to the restoration of environmental quality in designated coastal waterbodies and in coastal waters generally; and

"(G) recommendations for actions to assure the prompt and successful implementation of programs and measures to assure the quality of coastal waters.

"(2) The Administrator shall provide for public review and comment on the report provided for in this subsection.

"(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Administrator not to exceed $25,000,000 per fiscal year for each of fiscal years 1990, 1991, 1992, and 1993 for—

"(A) expenses related to the administration of this section, not to exceed 10 per centum of the amount appropriated under this subsection;

"(B) expenses related to the implementation of research and assessment activities pursuant to subsection

(c) of this section, including grants pursuant to paragraph (2) of subsection (c); and

"(C) making grants under paragraph (9) of subsection (d) of this section.

"(g) USE OF PENALTIES.—(1) Subsequent to the designation of a waterbody pursuant to this section, any penalties paid as a result of enforcement actions under section 309 or 404(s) of this Act by the Federal Government or a State for illegal activities in the designated waterbody shall be deposited into a special fund of the Treasury entitled the 'Estuaries Protection Fund'.

"(2) The amounts in such fund shall be available for appropriation to supplement funds authorized or appropriated pursuant to subsection (f) of this section and shall be used in accordance with the requirements of subsection (f) of this subsection.

"(3) To the extent practicable, the Administrator shall assure that the amounts contributed to the Estuaries Protection Fund from discharges within a given waterbody are used to support activities within that waterbody.".

POINT SOURCE DISCHARGES TO COASTAL WATERS

SEC. 102. COASTAL DISCHARGE STANDARD.—At the end of section 301 of the Federal Water Pollution Control Act add the following new subsection—

"(q) COASTAL DISCHARGE STANDARD.—

"(1) In the case of any waterbody designated pursuant to section 320 of this Act on or after January 1, 1989, the Administrator shall issue or renew a permit pursuant to section 402 of this Act only if the applicant demonstrates—

"(A) a need to discharge to the designated waterbody based on a showing of the full utilization of available waste minimization practices and technologies and the lack of alternative production processes or disposal options; and

"(B) that a proposed new discharge, or any increase in volume or toxicity of an existing discharge, will be offset by a decrease in other discharges or loadings to the waterbody resulting in no net increase in pollutant loading to the waterbody.

"(2) This subsection shall apply to all proposed, new discharges to a waterbody designated pursuant to section 320 of this Act one hundred and eighty days after the date of enactment of this section or at the date of designation of the waterbody pursuant to section 320 of this Act, whichever is later.

"(3) Notwithstanding the terms of any permit issued pursuant to section 402, this subsection shall apply to any existing discharge, except for discharges composed entirely of storm water, to a waterbody designated pursuant to section 320 of this Act which has a permit pursuant to section 402 three years after date of designation of a waterbody.

"(4) The Administrator may modify the requirements of paragraph (1) of this subsection, with respect only to an existing discharger, upon a showing by the owner or operator of such point source satisfactory to the Administrator that such modified requirements will—

"(A) represent the maximum use of technology within the economic capability of the owner or operator; and

"(B) result in reasonable further progress toward the elimination of the discharge of pollutants.

"(5) Nothing in this subsection relieves or reduces the obligation of a permittee to comply with the enforceable requirements of this Act.".

NONPOINT SOURCE POLLUTION CONTROL

SEC. 103. (a) COASTAL PROJECT CERTIFICATION.—Amend section 401 of the Federal Water Pollution Control Act by—

(1) adding to the first sentence of paragraph (a)(1) following the first occurrence of the phrase "navigable waters," the following "or any applicant for Federal

flood insurance for any activity which may result in any discharge to the navigable waters or any pollution of such waters,";

(2) replacing the phrase "licensing or permitting agency" with the phrase "licensing, permitting, or insuring agency" in each place that it occurs;

(3) replacing the term "discharge" with the phrase "discharge or pollution" in each place that it occurs, except for the first use of such term in the first sentence of paragraph (a)(1);

(4) replacing the phrase "license or permit" with the phrase "Federal license, permit, or flood insurance" in each place that it occurs, except in paragraph (a)(3);

(5) replacing the phrase "licensed or permitted" with the phrase "licensed, permitted, or insured" in each place that it occurs;

(6) adding to subsection (d), after the phrase "section 307 of this Act," the phrase "best management practices and measures under section 319 of this Act,"; and

(7) adding to the end thereof the following new subsection:

"(e) For the purposes of this section the term "Federa flood insurance" refers to insurance provided pursuant to the

National Flood Insurance Act for any new structure located in a flood plain associated with any coastal waters as defined in section 502 of this Act.".

(b) NATIONAL COASTAL REGISTERY.—Amend title V of the Federal Water Pollution Control Act by adding at the end thereof the following new section:

"NATIONAL COASTAL REGISTERY

"SEC. 520. (a) LISTING.—The Administrator shall establish a national registery of coastal land. The Administrator shall list land in the national registery based on submission of a completed application, in such form as the Administrator may prescribe, by the property owner providing basic information concerning the property including but not limited to—

"(1) the location and size of the property;

"(2) the physical characteristics of the property;

"(3) known wildlife habitat or other significant natural features or characteristics; and

"(4) proof of ownership of the land.

Inclusion of land in the National Coastal Registery shall be at the sole discretion of the land owner.

"(b) INFORMATION AND EDUCATION.—The Administrator shall operate a program to provide registrants of coastal land with informational and educational materials concerning—

"(1) land management and related practices to prevent water pollution and protect habitat;

"(2) activities and practices to protect and foster the development of aquatic life and wildlife;

"(3) measures to preserve and protect significant natural features of land or significant natural resources;

"(4) the activities of Federal, State, and local agencies to protect coastal waters including activities pursuant to sections 201, 309, 319, 320, 402, and 404 of this Act; and

"(5) the various requirements of Federal and State laws concerning land management, discharges to water, and other related activities.

Information provided pursuant to this paragraph may be adjusted to apply specifically to land within a given region of the country or a given State.

"(c) STATE PARTICIPATION.—At the request of a Governor of a State, the Administrator may delegate operation of the informational and educational program established by subsection (b) within such State to a State agency. Costs associated with activities pursuant to this section are eligible for funding under section 106 of this Act.

"(d) REGISTERY DOCUMENT.—The Administrator shall publish on a periodic basis a National Coastal Registery document identifying and summarizing land listed pursuant to this subsection and shall provide a copy to any person submitting a completed application pursuant to paragraph (1) of this subsection at no cost.

"(e) DEFINITION.—For the purposes of this subsection, the term "coastal land" means any property, including wetlands, which is located within two thousand five hundred feet of any coastal waters.".

(c) FAILURE TO SUBMIT MANAGEMENT PROGRAM FOR COASTAL WATERS.—Section 319(e) of the Federal Water Pollution Control Act as amended is amended by adding at the end thereof the following: "Beginning on August 4, 1989, in the case where a State has failed to submit a management program under subsection (b) or the Administrator does not approve such a management program for a watershed of coastal waters, a local public agency or organization may act pursuant to this subsection regardless of the views of the applicable State.".

(d) PRIORITY FOR GRANT ASSISTANCE.—Section 319(h)(5) of the Federal Water Pollution Control Act (33 U.S.C. 466 et seq.) is amended by striking "and" at the end of paragraph (C), inserting "and" at the end of paragraph (D), and adding the following—

"(E) control nonpoint source pollution of waters designated pursuant to section 320 of this Act.".

MARINE SANITATION DEVICES

SEC. 104. (a) PROHIBITION OF DISCHARGE TO DESIGNATED WATERS.—Section 312(f)(4) of the Federal Water

Pollution Control Act (33 U.S.C. 466 et seq.) is amended by adding at the end thereof the following new paragraph:

"(C) In the case of any waterbodies designated pursuant to section 320 of this Act, the Administrator shall, within one hundred and eighty days of such designation, by regulation completely prohibit the discharge from a vessel of sewage (whether treated or not) into such waters.".

(b) PENALTIES FOR PROHIBITED DISCHARGES.—Section 312(j) of the Federal Water Pollution Control Act is amended by adding to the first sentence following "subsection (h) of this section" the following: "or any prohibition established pursuant to paragraph (f) (3) or (4) of this section".

(c) STUDY OF PROGRAM IMPLEMENTATION.—Section 312 of the Federal Water Pollution Control Act, as amended, is amended by adding at the end thereof the following new subsection—

"(o) The Administrator, after consultation with the Secretary of the Department in which the Coast Guard is operating, shall conduct a study to determine the availability of adequate facilities for the safe and sanitary removal and treatment of sewage from vessels operating on coastal waters. Within twelve months of the date of enactment of this Act, the Administrator shall report to the Congress the results of such study and shall make recommendations concerning specific actions, including amendments to the Federal Water Pollution Control Act as amended, as are necessary to assure that adequate facilities for the safe and sanitary removal and treatment of sewage from vessels operating on coastal waters are reasonably available.".

MARINE COMBINED SEWER OVERFLOWS

SEC. 105. (a) MARINE COMBINED SEWER OVERFLOWS.—Amend title IV of the Federal Water Pollution Control Act by adding at the end thereof the following new section:

"SEC. 406. MARINE COMBINED SEWER OVERFLOW.

"(a) MARINE COMBINED SEWER OVERFLOW INVENTORY.—

"(1) Each State in which a municipality discharges overflows from combined storm-water sewers and sanitary sewers into coastal waters shall, within one year of the date of enactment of this section and biennially thereafter prepare and submit to the Administrator an inventory of all such discharges in the State which shall include—

"(A) identification of the location of each such discharge, and the waterbody affected;

"(B) identification of the municipal entity responsible for the discharge;

"(C) identification of the estimated volume of discharge over a one-year period and the estimated pollutant loading of the discharge over such period, including any pollutant introduced by an industrial discharger;

"(D) assessment of the proportion of the volume of the combined discharge to the volume capacity of the appropriate treatment works over the maximum measured or estimated storm event that would occur during a seven-day, ten-year storm event, or a one-day, two-year storm event, whichever is greater;

"(E) preliminary assessment of the potential to eliminate the discharge through flow reduction methods, including water conservation; and

"(F) the nature and status of any existing programs to eliminate such discharges.

"(b) MARINE COMBINED SEWER OVERFLOW ELIMINATION PROGRAMS.—

"(1) Any municipality listed pursuant to paragraph (B) of subsection (a)(1) shall develop and submit to the Administrator a program for the elimination of all discharges listed pursuant to paragraph (A) of subsection (a)(1).

"(2) The program required pursuant to this section shall be submitted to the Administrator not later than twenty-four months after the date of enactment of this section and shall—

"(A) identify best management practices, regulatory and nonregulatory programs, and other measures to be taken by the municipality to eliminate the discharge of overflows from combined storm-water sewers and sanitary sewers;

"(B) establish a schedule for development of plans and implementation of best management practices programs, and other measures providing for implementation of such practices, programs, and measures at the earliest practicable date but in no case more than three years from the date of submission of the program; and

"(C) estimate the costs of design and implementation of best management practices, programs, and other measures including the estimated financial contributions from local, State, and Federal sources.

"(3) The municipality shall provide for public review and comment on the program developed pursuant to this subsection and shall coordinate development of the program with the State agency developing the management program required pursuant to section 319(b) of this Act, with any management conference convened pursuant to section 320 of this Act, and with other interested local, regional, county, or other governments.

"(4) Not later than three months after the submission of a program pursuant to this section, the Administrator shall approve or disapprove the program. The Administrator shall approve the program only if—

"(A) the program meets the requirements of subsection (b)(2) of this section;

"(B) adequate authority exists or adequate financial resources are available to implement the program;

"(C) the schedule for implementation of the program as expeditious as practicable, but in no case later than five years from the date of program approval; and

"(D) the practices, programs, and measures proposed in the program are adequate to assure the elimination of discharges of overflows from combined storm-water sewers and sanitary sewers or the municipality has applied for a permit pursuant to section 402 of this Act for any discharge of overflows not to be eliminated.

"(5) If the Administrator disapproves the program pursuant to this subsection, the Administrator shall notify the municipality of any revisions or modifications necessary to obtain approval. The municipality shall have three months to submit its revised plan and the Administrator shall approve or disapprove the program in three months.

"(6) Any municipality required to develop a program pursuant to this section which does not have an approved program by the date thirty-six months after the date of enactment of this section or which fails to implement the program shall be subject to penalties pursuant to subsections (d) and (g) of section 309 of this Act.

"(7) Within thirty-six months from the date of enactment of this section, the Administrator shall modify or issue permits pursuant to section 402 of this Act for any discharge of combined storm-water sewers and sanitary sewers pursuant to subparagraph (D) of paragraph (4) of this subsection. Such permit shall provide a schedule which will assure implementation of treatment as defined by section 304(d)(1) of this Act and such additional treatment as will assure that the discharge will not contribute to the violation of a water quality or sediment quality standard pursuant to this

Act as expeditiously as possible but not less than five years from the date of permit issuance.

"(8) Nothing in this section shall either relieve any municipality from liability for any existing violation of this Act, or eliminate any existing duty to obtain a permit pursuant to section 402 of this Act.

"(c) COMBINED SEWER OVERFLOW ELIMINATION GUIDANCE.—

"(1) Within one year from the date of enactment of this section, the Administrator shall publish guidance describing best management practices, regulatory, and nonregulatory programs, and other measures for the elimination of combined storm-water and sanitary sewer overflows including, but not limited to—

"(A) implementation of domestic water conservation programs to reduce sewage influent;

"(B) implementation of inflow and infiltration reduction measures to reduce volumes of sewage and storm-water influent;

"(C) implementation of requirements for volume reduction or elimination and detention during and following storm events by industrial users;

"(D) implementation of storm-water management controls, including decentralized storm-water detention basins, buffer strips, and related controls;

"(E) construction of detention facilities for storage of combined influent prior to treatment at the publicly owned treatment works or increases in capacity of publicly owned treatment works;

"(F) estimated, average design and construction schedules and costs for best management practices, programs, and other measures; and

"(G) model local ordinances or regulations, including model amendments to local pretreatment programs.

"(2) Any delay by the Administrator in issuing guidance under this provision shall not excuse the obligation of any municipality to comply with the requirements of this section.

"(3) The Administrator shall consult with public interest groups and other interested parties in development of guidance pursuant to paragraph (1).

"(d) DEFINITION.—For the purposes of this subsection, the term 'treatment works' shall be as defined in section 212(2) of this Act.".

(b) ELIGIBILITY FOR STATE REVOLVING LOAN FUNDS.—

(1) Amend section 601(a) of the Federal Water Pollution Control Act by striking "and (3)" and inserting in lieu thereof:

"(3) for developing and implementing a conservation and management plan under section 320, and (4) implementing a combined storm-water and sanitary sewer elimination program under section 406(b).".

(2) Amend section 603(c) of the Federal Water Pollution Control Act by striking "and (3)" and inserting in lieu thereof:

"(3) for developing and implementing a conservation and management plan under section 320, and (4) implementing a combined storm-water sewer and sanitary sewer elimination program pursuant to section 406(b).".

(c) GRANT ASSISTANCE.—Amend section 201(n)(2) of the Federal Water Pollution Control Act by striking the last sentence and inserting in lieu the following: "Such assistance shall be provided only for development of combined storm-water and sanitary sewer elimination programs pursuant to section 406(b) of this Act. The Administrator shall allocate available funds to address the most significant water pollution problems and shall give priority to municipalities discharging to waters designated pursuant to section 320 of this Act. The amount of grants to any municipality under this subsection for a fiscal year shall not exceed 75 per centum of the costs of a project and shall be made on the condition that the non-Federal share of such costs are provided from non-Federal sources.".

(e) REPORTING.—Amend section 516(b)(1) of the Federal Water Pollution Control Act by adding at the end thereof the following new sentence: "For the purposes of this subsection, the term 'treatment works' shall include any discharges from combined storm sewers and sanitary sewers and shall reflect the data provided by States pursuant to section 406(a) this Act.".

COASTAL WATER QUALITY AND SEDIMENT QUALITY STANDARDS

SEC. 106. (a) Section 303 of the Federal Water Pollution Control Act is amended by adding at the end thereof the following new subsection—

"(i) COASTAL WATER QUALITY AND SEDIMENT QUALITY STANDARDS.—

"(1) The Administrator shall promulgate numerical standards for coastal water quality, and coastal sediment quality. Such standards shall assure the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife and provide for recreation in and on the water.

"(2) The Administrator shall, within twenty-four months of the date of enactment of this subsection and biennially thereafter, promulgate standards pursuant to this section for those pollutants for which criteria and information have been established pursuant to section 304(a) and 304(n) of this Act which are adequate to assure the uses identified in paragraph (1) of this section.

"(3) In the case of a pollutant for which criteria and information under section 304(a) and 304(n) have not been developed, any person may petition the Administrator to develop such criteria. Any petitioner shall provide evidence of the negative effect of the pollutant on the marine environment. The Administrator shall approve the petition if he determines that the pollutant is impairing or preventing the attainment of the uses identified in paragraph (1) in the coastal waters of three or more States. Within six months of the receipt of a petition, the Administrator shall publish a notice in the Federal Register approving or denying the petition. If the Administrator fails to announce a decision pursuant to this paragraph, such petition shall be deemed approved.

"(4) In the case of approval of a petition pursuant to paragraph (3) of this subsection, the Administrator shall, within twenty-four months of the date of such decision, publish criteria and information for such pollutant pursuant to sections 304(a) and 304(n).

"(5) Any standard adopted by a State pursuant to the authorities of this Act shall have precedence in application to all activities and authorities pursuant to this Act, unless the standard adopted pursuant to this subsection is more stringent or protective of human health and the environment than the standard adopted by the State, in which case the standard adopted pursuant to this subsection shall apply.

"(6) The Governor of any State may petition the Administrator to establish a lower numerical standard than the numerical standard adopted for a pollutant pursuant to this subsection for the coastal waters of that State. A Governor's petition shall provide evidence that the application of the lower numerical standard will assure a degree of protection to human health and the environment equal to that provided by the standard adopted pursuant to this section and that the lower numerical standard is appropriate because of significant differences in the biological, physical, and chemical characteristics of the waters in question and the coastal waters of the United States. Within six months of the date of the petition, and after holding a hearing in the area of the State identified in the petition, the Administrator shall publish in the Federal Register a notice approving or disapproving the petition and providing an explanation of such action.

"(7) The Administrator may comply with the requirements to establish sediment quality standards under this subsection by establishing a scientific method for converting numerical water quality standards to numerical sediment quality standards. Any such method shall be reviewed and approved by the Science Advisory Board of the Environmental Protection Agency.".

OCEAN DISCHARGE CRITERIA

SEC. 107. AMENDMENTS TO OCEAN DISCHARGE CRITERIA.—

(a) CLARIFICATION OF SCOPE.—Strike section 403(a) of the Federal Water Pollution Control Act and insert in lieu thereof the following—

"(a) OCEAN DISCHARGE CRITERIA.—In addition to any other requirements of this Act, no permit shall be issued under section 402 of this Act for a discharge into the territorial sea, the waters of the contiguous zone, the oceans, or, beginning one hundred and eighty days after the date of enactment of this subsection, the coastal waters, if the Administrator finds, based on an assessment of the criteria provided in subsection (c), that the discharge will prevent the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife and will not provide for recreation in and on the water or that the discharge will prevent the attainment of standards established pursuant to section 303(i) of this Act.".

(b) Revision.—Strike the first five lines of paragraph (c)(1) of section 403 and insert in lieu thereof the following:

"(c)(1) In assessing the effects of a proposed discharge on the coastal and marine environment, the Administrator shall consider—".

(c) Limitation of regulations.—Amend paragraph (c)(2) of section 403 by adding at the end thereof the following: "Any existing or proposed regulations creating exemptions to the limitations of this section are herewith deemed invalid.".

Sec. 108. Definitions.—Section 502 of the Federal Water Pollution Control Act is amended by adding at the end thereof the following new subsections:

"(21) The term 'Administrator' means the Administrator of the Environmental Protection Agency.

"(22) The term 'Under Secretary' means the Under Secretary of Commerce for Oceans and Atmosphere, who serves as the Administrator of the National Oceanic and Atmospheric Administration.

"(23) The term 'Federal agency' means any department, agency, or other instrumentality of the Federal Government, any independent agency or establishment of the Federal Government including any Government Corporation.

"(24) The terms 'estuary' and 'estuarine zone' have the meanings such terms have in section 104(n)(4) of the Federal Water Pollution Control Act, except that the terms shall also include associated aquatic ecosystems and those tributaries draining into the estuary up to the historic head of tidal influence.

"(25) The terms 'coastal waters' or 'coastal waterbody' refer to estuaries, waters of the estuarine zone, and any other waters seaward of the historic height of tidal influence to the outer boundary of the territorial sea.

"(26) The term 'coastal sediment' refers to sediments underlying coastal waters.".

TITLE II—MARINE SEDIMENT CONTAMINATION

MARINE SEDIMENT CRITERIA AND INFORMATION

SEC. 201. COASTAL SEDIMENT CRITERIA AND INFORMATION.—Amend section 304 of the Federal Water Pollution Control Act by adding at the end thereof the following new subsection—

"(n) COASTAL SEDIMENT CRITERIA AND INFORMATION.—

"(1) In the case of any pollutant for which criteria and information are published pursuant to subsection (a) of this section, the Administrator shall, within twenty-four months of the date of enactment of this Act, revise and republish such criteria and information as necessary to assure that such criteria and information address coastal sediment to an extent adequate for development of sediment standards pursuant to section 303(i) of this Act. Criteria and information concerning coastal sediment shall be comprehensive and comparable to criteria and information concerning water quality.

"(2) Beginning one hundred and eighty days from the date of enactment, the Administrator shall provide that any criteria and information published pursuant to subsection (a) of this section shall address the quality of coastal sediment to an extent adequate for development of sediment standards pursuant to section 303(i) of this Act, and that such criteria and information is comprehensive and in all ways comparable to criteria and information concerning water quality.".

MARINE SEDIMENT CONTAMINATION

SEC. 202. (a) CONTAMINATION OF DREDGE MATERIAL.—

(1) Amend section 1413(a) of the Marine Protection, Research and Sanctuaries Act by striking "and

(d)" in the first sentence and adding in lieu thereof the following: "(d) and (f)".

(2) Amend section 1413(c) of the Marine Protection, Research and Sanctuaries Act by adding to the second sentence following "critical areas," the following: "or an assessment of contamination pursuant to subsection (f) of this section,".

(3) Amend section 1413 of the Marine Protection, Research and Sanctuaries Act by adding at the end thereof the following new subsection:

"(f) CONTAMINATION OF DREDGE MATERIAL.—

"(1) Prior to making a determination to issue a permit pursuant to subsection (a) of this section, or initiating a Federal project pursuant to subsection (e), the Secretary shall assess the material to be dredged and determine whether the material contains pollutants in concentrations in excess of the concentrations, established in sediment standards established pursuant to section 303(i)(1) of the Federal Water Pollution Control Act.

"(2) If the Secretary finds that material to be dredged contains pollutants in concentrations in excess of sediment standards established pursuant to section 303(i)(1) of the Federal Water Pollution Control Act, dumping of such material shall not require a permit pursuant to this section but shall, notwithstanding any other provision of law, require a permit pursuant to section 1412 of this Act.".

(b) Special Management of Contaminated Dredge Material.—Amend section 1412 of the Marine Protection, Research and Sanctuaries Act by adding a new subsection at the end thereof:

"(f) Special Management of Contaminated Dredge Material.—

"(1) In a case where the Administrator approves a permit for the dumping of dredge material which has been found to be contaminated pursuant to subsection 1413(f) of this Act, the Administrator shall, in addition to such other limitations as appropriate pursuant to this section or section 1414, provide that the permit for such dumping will—

"(A) require that dumping occur at a time of year that will result in minimual adverse impact on aquatic resources and on potential migration of material from the designated site;

"(B) be for a period of not to exceed one year;

"(C) beginning eighteen months after the date of enactment of this Act, require the implementation or best management practices established by the Administrator pursuant to paragraph (2) of this subsection; and

"(D) beginning three years from the date of enactment of this Act, require that dumping occur at a dumpsite designated pursuant to section 1412(c) of this Act as suitable for the dumping of contaminated dredge material.

"(2) Within eighteen months of the date of enactment of this Act, the Administrator, after consultation with the Secretary, shall publish in the Federal Register a description of best management practices to be used in the dredging, transport, and disposal of dredge material found to be contaminated pursuant to section 1413(f) of this Act. Best management practices shall be designed to minimize, to the fullest extent practicable, the migration of pollutants to the water column, dispersion of pollutants, and impact of dredging, transport, or disposal on the marine environment.

(c) GENERAL PERMITS.—Section 1414(c) is amended by adding at the end thereof the following: "No general permit may be issued pursuant to this subsection for material determined to be contaminated pursuant to section 1413(f) of this title.".

STATE OCEAN DUMPING REQUIREMENTS

SEC. 203. STATE OCEAN DUMPING REQUIREMENTS.—Strike section 1416(d) of the Marine Protection, Research and Sanctuaries Act and insert in lieu thereof the following new section:

"(d)(1) Any State may adopt criteria, rules, or regulations relating to dumping of materials into ocean waters within its jurisdiction, only if such criteria, rules or regulations are more stringent and protective of such waters than the criteria, rules, or regulations of this Act.

"(2) Any criteria, rules, or regulations adopted pursuant to paragraph (1) of this subsection shall be transmitted to the Administrator and to the Secretary within thirty days of the date of adoption by the State and, upon receipt, the Administrator and the Secretary shall assure compliance with such criteria, rules, and regulations.".

SITE DESIGNATION

SEC. 204. (a) SITE DESIGNATION AMENDMENTS.—Strike section 1412(c) of the Marine Protection, Research and Sanctuaries Act (33 U.S.C. 1412 et seq.) and insert in lieu thereof the following:

"(c)(1) The Administrator may, consistent with the criteria established pursuant to subsection (a) of this section, designate sites or times for dumping, including dumping pursuant to subsection (e) of section 1413.

"(2) The Administrator shall, when he finds it necessary to protect critical areas, designate sites or times within which certain materials may not be dumped, including dumping pursuant to subsection (e) of section 1413.

"(3) The Administrator, in cooperation with the Undersecretary, shall develop and implement a site management plan for each site designated pursuant to this section. Such plan shall include—

"(A) a baseline assessment of environmental conditions at the site;

"(B) special management conditions to be implemented at each site to minimize to the fullest extent practicable adverse impacts on aquatic life and to prevent the migration of contaminants from the site;

"(C) a program of monitoring for each site including:

"(i) water quality at the site and in the area of the site;

"(ii) sediment quality at the site and in the area of the site;

"(iii) the diversity, productivity, and stability of aquatic organisms at the site and in the area of the site; and

"(iv) such other conditions as the Administrator deems appropriate.

"(D) the anticipated use and management of the site over the following twenty-year period including the expected termination of dumping at the site, the anticipated need for site management, including pollution control, following the termination of the use of the site.

"(4) Not less than five years after the date of designation of a site pursuant to this section, and every five years thereafter, the Administrator shall review the designation of each site designated pursuant to this section and shall redesignate such site if such redesignation is consistent with the criteria established pursuant to paragraph (1) of this subsection and subsection (a) of this section.

"(5) In designation or redesignation of sites pursuant to this section, the Administrator shall determine whether the dumping of materials determined to be contaminated pursuant to section 1413(f) of this Act or section 404(u) of the Federal Water Pollution Control Act at the site would be consistent with the criteria established pursuant to subsection (a). If the Administrator determines that the dumping of contaminated materials is not consistent with such criteria, the Administrator shall prohibit the dumping of such materials at the site.

"(6) The Administrator shall provide for public review and comment of designation actions including the management plan pursuant to paragraph (3) of this subsection and shall hold a hearing on the proposed designation or redesignation in the region of the country in which the site is located.".

(b) PERMIT CONDITIONS.—(1) Amend section 1414(a) of this Act by inserting in lieu of paragraph (4) the following:

"(4) such requirement, limitations, or conditions as are necessary to assure consistency with any site management plan approved pursuant to section 1412(c) of this title.".

(2) Amend section 1414(a) by adding at the end thereof the following: "Permits issued under this title shall be for a period not to exceed two years.".

(c) WAIVER AMENDMENT.—Amend section 1413(d) by striking all of the first sentence after "in the disposition of dredged material," and inserting in lieu thereof the following: "disposal at a site designated pursuant to section 1412(c)(1) in a manner which is not consistent with the requirements of a site management plan adopted pursuant to paragraph (3) of section 1412 of this title is necessary for the national defense he shall so certify and request a waiver from the Administrator for the specific requirements involved.".

DREDGE AND FILL PROGRAM

SEC. 205. SPECIAL MANAGEMENT OF CONTAMINATED MATERIAL.—

(1) Add to the end of section 404 of the Federal Water Pollution Control Act the following new section:

"(u)(1) Within three hundred and sixty days of the date of enactment of this subsection, the Administrator shall revise guidelines established pursuant to subsection (b) of this section to require that an applicant for a permit pursuant to this section proposing to dispose of dredge or fill material in coastal waters shall establish whether concentrations of the material contains pollutants in excess of the concentrations established in sediment standards pursuant to section 303(i)(1) of this Act.

"(2) If the Secretary finds that an applicant for a permit pursuant to this section proposes to dispose of contaminated material pursuant to paragraph (1) of this subsection, the Secretary, in consultation with the Administrator, shall consider, in addition to any guidelines established by the Administrator pursuant to subsection (b) of this section—

"(A) alternative locations for the disposal of such material, including sites designated pursuant to section 1412(c) of the Marine Protection, Research and Sanctuaries Act, which will minimize adverse impacts on the environment;

"(B) the potential for the disposal of the material to result in violations of water quality standards;

"(C) limitations on the schedule of operations which will mitigate and minimize adverse impacts on the environment;

"(D) limitations or management practices, including management practices identified pursuant to section 1412(f)(2) of the Marine Protection, Research and

Sanctuaries Act, which will minimize the migration of contaminants from the disposal area or to water including isolation or capping of the contaminated material by uncontaminated material or disposal in upland areas;

"(E) requirements for long-term monitoring of contaminant concentrations at the disposal site, including maintenance of any management practices for preventing migration of contaminants; and

"(F) demonstration of financial capacity to assure the effective compliance with permit requirements in the short term and the long term.

"(3) In any case where the Secretary finds that material proposed for disposal is contaminated pursuant to paragraph (1) and the proposed disposal site is located within an area designated by the Administrator pursuant to section 320 of this Act, the Secretary shall deny such permit application.".

TITLE III—OTHER PROVISIONS

STUDY OF AIR DEPOSITION

. SEC. 301. REPORT.—The Administrator shall, within twenty-four months of the date of enactment of this Act, submit to the Congress a report which provides an assessment of the extent and seriousness of airborne deposition of contaminants in coastal waters.

IDENTIFICATION OF UNREGULATED CONTAMINANTS

SEC. 302. AMENDMENT TO MARINE RESEARCH AUTHORITY.—(1) Add to section 104(n) of the Federal Water Pollution Control Act the following new paragraphs—

"(5) The Administrator shall conduct such research and monitoring as needed to identify currently unregulated pollutants in the estuarine zone and coastal waters not currently addressed in a guideline developed pursuant to section 301 of this Act or a standard developed pursuant to section 303 of this Act.

"(6) Within one year of the date of enactment of this paragraph, the Administrator shall submit to the Congress a report identifying unregulated pollutants in the estuarine zone and coastal waters and providing a plan (including specific actions and recommendations for legislation, schedules, and necessary budget commitments) for implementation of such controls as are necessary to protect a balanced, indigenous population of shellfish, fish, and wildlife and allow for recreational activities in and on the water.".

(2) Insert in section 104(n) of the Federal Water Pollution Control Act the term "and coastal waters" following the term "estuarine zones" in each place that it appears.

RESEARCH OF MICROORGANISMS

SEC. 303. REPORT.—The Administrator shall, within twenty-four months of the date of enactment, submit to the Congress a report on the potential use of microorganisms to degrade pollutants such as organic material or chemical pollutants in municipal or industrial wastes both before and after disposal in the marine environment.

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II

101st CONGRESS
1st Session

S. 1179

To establish a comprehensive marine pollution restoration program, to amend the Federal Water Pollution Control Act and the Marine Protection, Research, and Sanctuaries Act, and for other purposes.

IN THE SENATE OF THE UNITED STATES

June 14 (legislative day, January 3), 1989

Mr. Lautenberg (for himself, Mr. Mitchell, Mr. Chafee, Mr. Moynihan, Mr. Lieberman, Mr. Graham, Mr. Bradley, Mr. D'Amato, Mr. Pell, Mr. Fowler, Mr. Dodd, Mr. Sarbanes, and Mr. Cohen) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To establish a comprehensive marine pollution restoration program, to amend the Federal Water Pollution Control Act and the Marine Protection, Research, and Sanctuaries Act, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE AND TABLE OF CONTENTS

Section 1. (a) Title.—This Act may be cited as the "Comprehensive Ocean Assessment and Strategy (Coast) Act of 1989".

(b) Table of Contents.—

Sec. 1. Short title and table of contents.
Sec. 2. Findings.
Sec. 3. Policy.
Sec. 4. Definitions.
Sec. 5. National marine environment assessment.
Sec. 6. Marine toxics release inventory assessment and strategy.
Sec. 7. Marine quality criteria and standards.
Sec. 8. Marine pollutant discharge criteria.
Sec. 9. Nonpoint source pollution.
Sec. 10. Marine combined sewer overflows.
Sec. 11. Pretreatment requirements.
Sec. 12. Marine stormwater discharges.
Sec. 13. Marine monitoring, research and studies.
Sec. 14. Information transfer.
Sec. 15. Federal agency responsibilities.
Sec. 16. Ocean dumping penalties.
Sec. 17. Authorization.

FINDINGS

SEC. 2. The Congress finds that—

(1) the marine environment has substantial and direct importance to a large segment of the American population;

(2) the resources in the marine environment support commercial and recreational fishing, tourism, recreation, and related opportunities, and generate annual expenditures of tens of billions of dollars;

(3) the marine environment performs important ecological functions and living marine resources have significant ecological value;

(4) many areas in the marine environment have been degraded by numerous sources of waste disposal activities, agricultural practices, freshwater diversions, inadequately controlled development, habitat destruc-

tion and other actions adversely affecting their commercial, recreational, and ecological values; and

(5) according to the Office of Technology Assessment, in the absence of additional actions, the marine environment will become increasingly degraded.

POLICY

SEC. 3. It is the policy of the United States to restore, maintain, and protect the integrity of the marine environment so that full use of the ecological, commercial, and recreational values of its resources is not impaired by pollution.

DEFINITIONS

SEC. 4. For purposes of the Act—

(1) the term "Administrator" means the Administrator of the Environmental Protection Agency;

(2) the terms "degraded" and "degradation" means conditions in the waters, sediments, and living marine resources of an area of the marine environment which do not—

(A) assure protection of public health, public water supplies, and agricultural and industrial uses;

(B) assure the protection and propagation of a balanced indigenous population of fish, shellfish and wildlife; and

(C) allow recreational activities in and on the water;

(3) the term "floatable" means marine debris that float or remain suspended in the water column;

(4) the term "Federal agency" means any department, agency, or other instrumentality of the Federal Government;

(5) the term "living marine resource" means fish, shellfish, marine mammals, birds, wildlife, and plants which are located in or use the marine environment for all or part of their lives;

(6) the term "marine areas in need of protection" means an area of the marine environment designated by the Administrator pursuant to section 5(a) of this Act which requires additional measures to manage or control sources of pollutants because the area is or is likely to become degraded;

(7) the term "marine combined sewer overflow" means a discharge from combined stormwater sewers and sanitary sewers into the marine environment;

(8) the term "marine environment" means the waters, sediments, and living marine resources found in the estuarine zone as that term is defined in section 320(k) of the Federal Water Pollution Control Act, the territorial sea and the United States Exclusive Economic Zone;

(9) the term "pollutant" shall have the same definition as in section 502(6) of the Federal Water Pollution Control Act; and

(10) the term "Under Secretary" means the Under Secretary of Commerce for Oceans and Atmosphere who serves as the Administrator of the National Oceanic and Atmospheric Administration.

NATIONAL MARINE ENVIRONMENT ASSESSMENT

SEC. 5. (a) IDENTIFICATION.—The Administrator, in close cooperation with the Under Secretary, shall, within twelve months of the enactment of this Act, and thereafter as part of each report submitted to Congress pursuant to section 305(b) of the Federal Water Pollution Control Act, designate marine areas which are in need of protection.

(b) DESIGNATION CRITERIA.—(1) In designating such marine areas, the Administrator and the Under Secretary shall consider—

(A) the status and trends of the amount, type, and extent of pollutants found in the water, sediments, and living marine resources including information provided in the national toxics release inventory established pursuant to section 313 of the Superfund Amendments and Reauthorization Act of 1986;

(B) the likely effect of these pollutants on human health, living marine resources, and commercial and recreational opportunities, and marine ecological values;

(C) loss of coastal habitat;

(D) changes in living marine resources in the area;

(E) whether the presence of floatable in the area is adversely affecting commercial and recreational opportunities; and

(F) anticipated increases in pollutants and floatables in the area.

(2) The Administrator shall designate as a marine area in need of protection:

(A) any area of the marine environment for which the State's most recent Water Quality Inventory, prepared pursuant to section 305(b) of the Federal Water Pollution Control Act reported that the waters did not achieve water quality, sediment quality and living marine resource biological quality standards, and

(B) any estuary for which a management conference has been convened pursuant to the National Estuary Program established by section 320 of the Federal Water Pollution Control Act.

(3) The Administrator and the Under Secretary shall seek the views of Governors and the public prior to completing each assessment of marine areas in need of protection.

(4) In designating any such area, the Administrator shall specify the reason for, and to the extent known, the sources of pollution resulting in the designation.

(c) NATIONAL ASSESSMENT.—The Administrator shall submit to the Congress together with the report required by section 305(b) of the Federal Water Pollution Control Act, an analysis which lists each area designated pursuant to this section, assesses trends in degradation, identifies research and monitoring needs, describes actions taken pursuant to the Comprehensive Ocean Assessment and Strategy Act and other laws, and State efforts to develop and implement strategies for marine areas in need of protection, identifies additional actions which need to be taken to end marine degradation including problems associated with floatables, sets out a plan for future actions, and recommends legislative changes and budgetary needs.

(b) Section 304 of the Federal Water Pollution Control Act is amended by adding at the end thereof the following new subsection:

"(n) MANAGEMENT STRATEGIES FOR MARINE AREAS IN NEED OF PROTECTION.—

"(1)(A) Not later than eighteen months after the date of a designation of an area as a marine area in need of protection, each State shall, after notice and an opportunity for public comment, submit to the Administrator for review and approval an individual management strategy that the State will implement for each area under its jurisdiction designated under section 5 of the Comprehensive Ocean Assessment and Strategy Act. The strategy shall establish priorities and schedules for addressing pollution sources.

"(B) The strategy shall include establishment of technology-based and water quality effluent limitations, implementation of nonpoint source management programs, monitoring requirements for permittees and such other measures provided for under this Act as may be necessary so that the area no longer needs additional protection as soon as possible, but not later than three years after the date of establishment of such strategy.

"(C) The strategy must demonstrate that adequate authority exists and adequate resources are available to implement the strategy.

"(D) In developing the strategy under this section, the State shall utilize existing reports, data and studies and may utilize appropriate elements of any other plan approved under this Act to the extent such elements are consistent with and fulfill the requirements of this section and are related to the designated marine area in need of protection.

"(2) Not later than one hundred and twenty days after the last day of the period referred to in paragraph (1), the Administrator shall approve the management strategies submitted under paragraph (1) by any State if the strategy meets the requirements of this section.

"(3) If a State fails to submit a management strategy in accordance with paragraph (1) or the Administrator does not approve the management strategy submitted by such State, then, not later than one year after the last day of the period referred to in paragraph (2), the Administrator, in cooperation with such State and after notice and opportunity for public comment, shall develop and implement a management strategy pursuant to the requirements of paragraph (1) in such State.

"(4) The Administrator shall prepare and implement a management strategy pursuant to this subsection for any marine area in need of protection not under the jurisdiction of any State.".

(c) Section 320 of the Federal Water Pollution Control Act is amended—

(1) by adding at the end of subparagraph (2)(B) the following new subparagraph:

"(C) MARINE AREA IN NEED OF PROTECTION.—The Administrator shall select an estuary and convene a management conference for an estuary which is located in the waters of more than one State and which is designated as a marine area in need of protection pursuant to section 5 of the Comprehensive Ocean Assessment Strategy Act.".

(2) by inserting in paragraph (b)(4) before the comma the following: "and demonstrate that each State participating in a management conference has adequate authority and resources to implement the plan.".

MARINE ENVIRONMENT TOXICS RELEASE INVENTORY ASSESSMENT AND STRATEGY

SEC. 6. (a) Within six months of the enactment of this bill, the Administrator shall prepare and submit to the Congress a Marine Environment Toxics Release Inventory Assessment and Strategy.

(b) The Assessment shall contain an analysis of the industrial categories of sources and receiving waters of discharges of toxics emissions into the marine environment and into publicly owned treatment works which discharge into the marine environment. The Assessment shall identify those categories of sources which discharge the greatest amount of toxic chemicals on the Toxics Release Inventory and the greatest amount of the most toxic of the chemicals on the Inventory. It also shall identify geographical areas receiving the greatest amount of discharges from chemicals on the Inventory.

(c) The Strategy shall contain the Administrator's detailed plan for using the information in the Assessment to improve the Environmental Protection Agency's pollution programs ffecting the marine environment. The Strategy shall include plans to:

(1) verify information in permits issued by the Administrator or the State, as the case may be, pursuant to section 402 of the Federal Water Pollution Control Act;

(2) improve the program of individual control strategies for toxic pollutants established pursuant to section 304(1) of the Federal Water Pollution Control Act;

(3) identify other regulatory programs needing improvement including programs for toxic and pretreatment affluent standards established pursuant to section 307 of the Federal Water Pollution Control Act and to adopt measures to improve those programs;

(4) establish marine water quality criteria for toxic chemicals from the Inventory discharged in the greatest amounts;

(5) use the information in the Inventory to target compliance and enforcement actions; and

(6) establish programs to reduce the amount of toxic chemicals generated by industries identified in the Assessment.

MARINE QUALITY CRITERIA AND STANDARDS

SEC. 7. (a) Section 304(a) of the Federal Water Pollution Control Act is amended by:

(1) in paragraph (1) adding after the word "quality" the following: ", including criteria for marine water quality, marine sediment quality, and living marine resource biological quality, which will protect the marine environment from degradation.".

(2) adding at the end thereof the following:

"(9)(A) Within six months of enactment of the Comprehensive Ocean Assessment and Strategy Act, the Administrator shall submit a plan to the Senate Committee on Environment and Public Works, the House Committee on Public Works and Transportation, and the House Committee on Merchant Marine and Fisheries a detailed five-year schedule for the development of the criteria called for in paragraph (1).

"(B) In developing this schedule, the Administrator shall consult with the Under Secretary and the Governors of coastal States.

"(C)(1) The Administrator shall give priority to develop criteria for those pollutants in water, sediments, and living marine resources which pose the greatest threat of degradation to the marine environment.

"(2) The Administrator shall also consider the Marine Environment Toxics Release Inventory Assessment and Strategy prepared pursuant to section 6 of the Comprehensive Ocean Assessment and Strategy Act.

"(D) The Administrator shall review and revise existing criteria or develop new criteria for water, sediments, and living marine resources, as appropriate, within three years of the date of enactment of the Comprehensive Ocean Assessment and Strategy Act for the following pollutants:

(1) Halogenated compounds (excluding pesticides)—

(i) Brominated dioxins.

(ii) Dioxins.

(iii) Hexachlorobenzene.

(iv) PCBs.

(v) Trichlorobenzene.

(vi) Trichlorophenol.

(2) Polycyclic compounds—

(i) Nitrogen-containing heterocyclic compounds.

(ii) PAHs (including benzofurans, benzopyrenes, phenanthrene).

(3) Metals—

(i) Alkylated lead.

(ii) Antimony.

(iii) Arsenic.

(iv) Cadmium.

(v) Copper.

(vi) Mercury.

(vii) Selenium.

(viii) Tributyltin (and other organotins).

(4) Pesticides—

(i) DDT and metabolites.

(ii) Dieldrin.

(iii) Diflubenzuron (Dimilin).

(iv) Methoxychlor.

(v) Mirex.

(vi) Oxygen analogs of organophosphates.

(vii) Toxaphene.

(viii) Molting hormones.

(5) Others—

(i) Azo compounds.

(ii) DEHP.

(iii) Diphenyl ethers.

(iv) Terphenyls.

(v) Nutrients including nitrogen and phosphorous.

(b) Section 303 of the Federal Water Pollution Control Act is amended by adding the following new section:

"(i) MARINE WATER, SEDIMENT AND LIVING MARINE RESOURCE QUALITY STANDARDS.—(1) Within two years of the establishment of marine water, sediment, or living marine resource biological criteria pursuant to section 304(a), each coastal State shall establish a numerical standard for such pollutant to prevent degradation of the marine environment.

"(2) If a coastal State fails within two years of establishment of any criteria to adopt a numerical standard pursuant to paragraph (1), the Administrator shall designate the standard for such State within one year of the State's failure to act in the prescribed period.

"(3) The Administrator shall promulgate standards in areas of the marine environment not under the control of any State.".

(c) Section 302(a) of the Federal Water Pollution Control Act is amended by adding after "section 304(l)" the following: "or section 303(i) or section 304(n)".

MARINE POLLUTANT DISCHARGE CRITERIA

SEC. 8. (a) Section 301(a) of the Federal Water Pollution Control Act (33 U.S.C. 1311(a)) is amended by inserting "403" before "404."

(b) Section 403 of the Federal Water Pollution Control Act (33 U.S.C. 1343) is amended by—

(1) adding "(1)" after "(a)";

(2) adding a new paragraph "(2)" as follows:

"(2) In addition to any other requirements of this Act, beginning one year after the date of enactment of this paragraph, no permit shall be issued under section 402 of this Act for a discharge into the marine environment, if the Administrator finds, based on an assessment of the criteria provided in subsection (c), that the discharge can reasonably be expected to result in the degradation of the marine environment or that the discharge is reasonably likely to prevent the attainment of any standards established pursuant to section 303 of this Act.".

(3) deleting "territorial sea" and inserting in lieu thereof "marine environment" in subsection (b);

(4) deleting "waters of the territorial seas, the contiguous zone, and the oceans" and inserting in lieu thereof "the marine environment" in subsection (c);

(5) striking out "and" at the end of subparagraph (F) in subsection (c)(1), by striking out the period at the end of subparagraph (G) and inserting in lieu thereof "; and" and by inserting at the end thereof the following new subparagraph:

"(H) the potential application of measures, processes, methods, systems, or techniques including, but not limited to, measures which—

"(i) eliminate the discharge altogether or reduce the volume and amounts of such pollutants through process changes, substitution of materials or other modifications,

"(ii) enclose systems or processes to eliminate discharges, and

"(iii) collect, capture or treat such pollutants when discharged.";

(6) adding at the end of paragraph (c)(2) the following: "Any monitoring required as a condition of the permit shall not discharge the requirement of the preceding paragraph."; and

(7) inserting at the end of the section the following:

"(3) The Administrator shall, within one year after enactment of the Comprehensive Ocean Assessment and Strategy Act, and after notice and opportunity for public comment, revise the guidelines under this section.".

NONPOINT SOURCE POLLUTION

SEC. 9. (a) Section 319(g)(1) of the Federal Water Pollution Control Act is amended by—

(1) inserting after "standards" the following: ", marine sediment standards, or living marine resource biological quality standards,"; and

(2) inserting after the word "Act" the following: "or is degraded due to the presence of floatables.".

(b) Section 319(h)(5) of the Federal Water Pollution Control Act is amended by—

(1) striking "or" in subparagraph (C),

(2) striking the period at the end of subparagraph (D) and inserting in lieu thereof "; or "; and

(3) by inserting the following new subparagraph—

"(E) control nonpoint source pollution of waters determined to be in need of protection pursuant to section 5 of the Comprehensive Ocean Assessment and Strategy Act.".

(d) Section 319(k) of the Federal Water Pollution Control Act is amended by—

(1) inserting "(1)" after subsection (k); and

(2) adding the following new paragraph:

"(2)(A) The Administrator shall provide technical assistance to the Secretary of Agriculture in utilizing the Secretary's authorities to reduce cropland sources of nonpoint source pollution of the marine environment, consistent with subtitle D of title 12 of the Food Security Act (16 U.S.C. 3831–3836).

"(B) The Administrator shall identify, based on the assessment reports submitted by the States and approved by the Administrator or developed by the Administrator for the States pursuant to subsections (a), (d) and (e) of this section, and such other information as is available to the Administrator, those lands which, if enrolled in the Conservation Reserve Program, would contribute to the protection of water quality and the marine environment by reducing nonpoint source pollution. Where appropriate, the lands identified may include lands that are not erodible but that pose an off-farm environmental threat, pursuant to section 1231 (c)(2) of the Food Security Act (16 U.S.C. 3831(c)(2)).

"(C)(1) The Administrator shall furnish the list of such identified lands to the Secretary of Agriculture for purposes of assisting the Secretary in establishing priorities for expenditures under the Conservation Reserve Program and shall make such lists available to the States and the public.

(2) The Secretary shall provide the Administrator within six months of receiving the Administrator's list with the actions the Secretary will take to respond to the list. The Secretary shall provide a detailed explanation of any recommendation made by the Administrator which the Secretary will not implement.

MARINE COMBINED SEWER OVERFLOWS

SEC. 10. (a) Section 304 of the Federal Water Pollution Control Act is amended by adding the following new subsection.

"(o) MARINE COMBINED SEWER OVERFLOWS.—(1) For the purpose of adopting or revising effluent limitations for marine combined sewer overflows under this Act, the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, publish within one year of enactment of this subsection regulations to eliminate such overflows. Such regulations shall require—

"(A) proper operation and regular maintenance programs for the sewer system and the marine combined sewer overflow discharge points;

"(B) maximum use of the collection system for storage;

"(C) maximation of flow to the publicly owned treatment work for treatment;

"(D) prohibition of dry weather overflows; and

"(E) screening or other interim measures to control floatables in marine combined sewer overflow discharges.

"(2) Within one year of enactment of this section, the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, publish guidance on additional marine combined sewer overflow control measures that should be considered to bring marine combined sewer overflow discharges into compliance with all of the requirements of this Act. The guidance shall include, but not be limited to—

"(A) sewer separation;

"(B) improved operation and maintenance;

"(C) system-wide storm water management programs; including decentralized stormwaters detention basins, buffer strips and related controls;

"(D) pretreatment program modifications;

"(E) sewer ordinances;

"(F) flow minimization and hydraulic improvements, including domestic wastes conservation programs;

"(G) direct treatment of overflows;

"(H) sewer rehabilitation including inflow and infiltration reduction measures;

"(I) reduction of tidewater intrusion;

"(J) construction of combined sewer overflow controls within the sewer system or at the combined sewer overflow discharge point; and

"(K) construction of detention basins.

"(3) Guidance issued pursuant to paragraph (2) shall identify monitoring standards for marine combined sewer overflow discharges. Monitoring standards should be designed to—

"(A) characterize discharges, including this frequency, duration and pollutant loadings;

"(B) evaluate water quality impacts of these discharges; and

"(C) determine compliance with permit requirements.".

(b) The Federal Water Pollution Control Act is amended by adding the following new section after section 320:

"SEC. 321. MARINE COMBINED SEWER OVERFLOWS.

"(a) MARINE COMBINED SEWER OVERFLOW INVENTORY.—Each State with a marine combined sewer overflow shall, within six months of the date of enactment of this section and not later than every two years thereafter, submit to the Administrator an inventory of all such discharges in the State which shall include—

"(1) identification of the location of each such discharge and the receiving waterbody;

"(2) identification of the entity or entities which own and operate the marine combined sewer overflow system;

"(3) a determination whether each discharge point is—

"(A) not permitted;

"(B) permitted in conjunction with a publicly owned treatment work; or

"(C) permitted separately from a publicly owned treatment work; and

"(4) a determination whether each discharge point is in compliance with sections 301, 302, and 403.

"(b) PRIORITIES.—Each permitting authority shall establish a schedule to bring each marine combined sewer overflow discharge point into compliance with this Act. The permitting authority shall establish priorities for issuing permits and controlling discharges, based on an evaluation of known or suspected impacts from marine combined sewer overflow systems using estimates of flows, frequencies, durations and pollutant loadings.".

(c) Section 402 of the Federal Water Pollution Control Act is amended by adding the following new subsection:

"(o) MARINE COMBINED SEWER OVERFLOW DISCHARGES.—(1) Each municipality or publicly owned treatment works (in any case where a marine combined sewer system is owned or operated by more than one municipality) identifed pursuant to section 321, shall develop and submit to the Administrator or the State (in the case of a permit program approved under section 402 of this Act) a permit application within two years after the date of enactment of this section consistent with section 304(o) containing a program for the elimination of all discharges from the marine combined sewer overflow.

"(2) Where a marine combined sewer overflow system is owned and/or operated by more than one authority, each owner and operator shall assist in the preparation of an application pursuant to this section. The application shall specifically define the responsibilities and duties of each owner and operator and each individual owner and operator is responsible for the discharge coming from its marine combined sewer overflow system.

"(3) Each applicant shall submit a schedule for developing and implementing monitoring requirements and measures, and practices consistent with section 304(o) and any applicable water, sediment or living marine resource biological quality standards at the earliest practicable date but in no case more than five years from the date of submission of the application. The application shall include cost estimates for each control measure.

"(4) The Administrator or the State (in the case of any permit program approved under section 402 of this Act) shall issue a permit only if the application—

"(A) meets the requirements of section 304(o);

"(B) meets the requirements of any water, sediment or living marine resource biological quality standards including any requirements established pursuant to section 304(l);

"(C) demonstrates through an appropriate compliance schedule that the requirements of the Act will be achieved as expeditiously as possible but in no event later than seven years after enactment of this section;

"(D) includes any appropriate interim control measures including screening to control floatables and disinfectant;

"(E) includes adequate monitoring requirements and a reopener clause to adjust permit limits as a result of monitoring; and

"(F) demonstrates that adequate authority and financial resources are available to implement the control measures.

"(5) Any owner or operator of a marine combined sewer overflow who does not have a permit within thirty six months after the date of enactment of this section or who fails to meet the requirements of a compliance schedule shall be subject to penalties pursuant to section 309 of this Act.".

"(6) Nothing in this subsection relieves or reduces the obligation of any person to comply with any requirements of this Act.".

PRETREATMENT REQUIREMENTS

SEC. 11. Section 307 of the Federal Water Pollution Control Act is amended by adding at the end thereof, the following new subsection:

"(f)(1) When the Administrator or the State, as the case may be, determines that any publicly owned treatment work discharges toxic pollutants contributing to the degradation of the marine environment or the violation of a marine water, sediment, or living marine resource biological standard, the

Administrator or the State shall require the publicly owned treatment works to establish or revise its pretreatment program within one year to eliminate the pollutants contributing to the degradation or the violation of the standard.

"(2) A pretreatment program required by paragraph (1) shall include the following requirements as appropriate:

"(A) individual discharge permits to discharges into the publicly owned treatment works;

"(B) additional or revised local limits to control the discharge of toxic pollutants into publicly owned treatment works;

"(C) random sampling and/or inspection of industrial users;

"(D) development of enforcement response plans;

"(E) additional reporting requirements by industrial users;

"(F) notification by industrial users of any discharge into the publicly owned treatment works of a substance which is a listed or characteristic waste under section 3001 of the Resource Conservation and Recovery Act; and

"(G) notification by industrial users in advance of any substantial change in the volume or character of pollutants in their discharge.

"(3) Nothing in this subsection shall affect any obligations established under this Act.

"(g)(1) The Administrator shall develop and test guidelines for publicly owned treatment works to identify the sources of toxics found in waste waters.

"(2) The Administrator shall establish a data base of sources of toxics in waste water which have been identified by publicly owned treatment works.".

MARINE STORMWATER DISCHARGES

SEC. 12. Section 402(p) of the Federal Water Pollution Control Act is amended by—

(1) adding at the end of paragraph (2) the following:

"(E) A discharge from a municipal separate storm sewer system into waters of a marine area in need of protection, as defined in section 5 of the Comprehensive Ocean Assessment and Strategy Act, and for which the Administrator or the State, as the case may be, determines is reasonably likely to be contributing to the violation of marine water, sediment, or living marine resource quality biological standards or the degradation of the marine environment."; and

(2) adding at the end of paragraph (4) the following:

"(C) MARINE AREAS IN NEED OF PROTECTION.—Not later than two years after the date of enactment of this subsection, the Administrator shall establish regulations setting forth the permit application requirements for stormwater discharges described in paragraph (2)(F). After the promulgation of these regulations, applications for permits for such discharges shall be filed no later than sixty days after the designation of the stormwater discharge.".

MARINE MONITORING, RESEARCH AND STUDIES

SEC. 13. (a)(1) ATMOSPHERIC POLLUTANTS.—The Administrator and the Under Secretary shall establish and implement a joint program of research and monitoring to determine the effects of atmospheric pollutants, including atmospheric nutrient and toxicant deposition, on degradation of the marine environment.

(2) The program shall include—

(A) development of an atmospheric pollutant deposition measurement methodology;

(B) development and implementation of a coastal atmospheric dry and wet deposition monitoring network; and

(C) research on—

(i) sources and deposition rates (including seasonal and temporal variations) of atmospheric pollutants;

(ii) the fate and transport of atmospheric pollutants including the modeling of transport and deposition at a scale compatable with water quality modeling;

(iii) the relative contribution of atmospheric pollutants to the total pollution loadings; and

(iv) the biological and ecological effects of atmospheric pollutants.

(3) The Administrator and the Under Secretary shall submit a report to the Senate Committee on Environment and Public Works, the House Committee on Public Works and Transportation, and the House Committee on Merchant Marine and Fisheries describing their monitoring and research program within two years of enactment of this Act and every two years thereafter.

(b) FLOATABLES MONITORING.—(1) The Administrator, in cooperation with the Under Secretary, State and local governments, and the public, shall establish a systematic nationwide system for monitoring and quantifying the accumulation of floatables along coastal shorelines and waterways and the costs of cleanup of floatables. The program shall include the development of standard protocols to conduct surveys to allow quantitative geographic and temporal comparisons and a public education program.

(2) The Administrator shall submit a report to the Congress within two years of the enactment of this section describing the monitoring program and the results of monitoring undertaken after enactment of this section. The Administrator shall report annually describing changes in the monitoring program and trends of floatables accumulation.

(c) MONITORING PROTOCOLS.—(1) The Administrator, in consultation with the Under Secretary, shall promulgate protocols for monitoring water, sediments and living marine resources in the marine environment within two years of the enactment of this section.

(2) Protocols promulgated under the subsection shall require use of whole effluent biological toxicity testing.

(3) Protocols promulgated under this subsection may establish different requirements based on the size, location and amount and source of the discharge.

(4) Within six months after the promulgation of such protocols, monitoring of the marine environment by Federal, State and local agencies and by any person required to conduct monitoring under this Act, the Federal Water Pollution Control Act or the Marine Protection, Research and Sanctuaries Act, shall be conducted consistent with the protocols.

(d) HEALTH IMPACTS STUDY.—The Under Secretary, in collaboration with the Administrator and the Secretary of Health and Human Services, shall undertake a study to determine the nature of any relationship between contact with pollutants in the marine environment and shellfish consumption with the incidence of human illnesses. The Administrator shall submit a report to the Senate Committee on Environment and Public Works, the House Committee on Public Works and Transportation, and the House Committee on Merchant Marine and Fisheries within two years of enactment of this section.

(e) ECONOMIC IMPACT STUDY.—The Under Secretary, in consultation with the Administrator, State and local governments, commercial and recreational fisherman and other interested persons, shall submit to the Congress within one year of enactment of this section a study which quantifies the economic impacts caused by marine degradation including floatables.

(f) ALGAL BLOOM STUDY.—The Under Secretary shall conduct a study of the impact that enhanced nitrogen levels in the marine environment may have on stimulating toxic algal blooms. The Under Secretary shall submit a report to Congress on the study's conclusions within two years of the enactment of this Act.

INFORMATION TRANSFER

SEC. 14. The Under Secretary shall establish a Marine Environment Information Center to compile, analyze, and disseminate information on assessing marine degradation, on methods, practices and techniques effective in restoring and protecting the marine environment and on other issues related to marine environment degradation. The Under Secretary shall use the Center to—

(1) transfer marine degradation analyses, assessments and technology and practices,

(2) mount active outreach and education programs to the state and local governments and other appropriate agencies and organizations to improve progress to address marine environmental degradation, and

(3) make available to the public such information on marine environmental degradation as may be available.

FEDERAL AGENCY RESPONSIBILITIES

SEC. 15. (a) STUDY OF FEDERAL AGENCY PROGRAMS.—(1) The Administrator and the Under Secretary shall conduct a comprehensive study of the policies, programs and activities of each Federal agency that may result in degradation of the marine environment. The study shall specifically examine the mechanisms, policies, programs and activities that contribute to degradation of the marine environment.

(2) Within eighteen months of the enactment of this Act, the Administrator and the Under Secretary shall submit to Congress a report describing the conclusions of the comprehensive study and recommendations they have to reduce degradation of the marine environment from Federal agencies' policies, programs and activities. The report shall include—

(A) a comprehensive listing of each Federal agency's policies, programs and activities that were considered during the study to affect degradation in the marine environment;

(B) a detailed analysis of the impacts of each Federal agency's policies, programs, and activities on degradation of the marine environment;

(C) proposed changes in each Federal agency's policies, programs and activities to minimize these impacts;

(D) suggested actions to be taken by other Federal or State agencies in order to better coordinate all policies, programs, and activities that affect degradation of the marine environment; and

(E) specific recommendations for further legislative actions necessary to bring each Federal agency's policies, programs and acivities into conformance with the policy of this Act.

(3) In conducting their reviews, the Administrator and the Under Secretary shall seek the views of States and the public on ways in which each Federal agencies' policies, programs and activities can be implemented to reduce degradation in the marine environment.

(b) FEDERAL AGENCY LEADERSHIP.—Each Federal agency shall provide leadership and take action to the extent provided by law to minimize degradation of the marine environment and to restore and preserve the natural and beneficial values served by the marine environment in carrying out its responsibilities for—

(1) acquiring, managing, and disposing of Federal lands and facilities;

(2) providing federally undertaken, financed, or assisted construction and improvements; and

(3) conducting Federal activities and programs affecting the marine environment.

(c) FEDERAL AGENCY RESPONSIBILITY.—In carrying out the activities described in subsection (b), each agency has a responsibility to evaluate the potential effects of any action it may take in or which may affect the marine environment, to ensure that its planning programs and budget requests reflect of the policy of this Act.

(d) ALTERNATIVES AND MITIGATION.—If a Federal agency has determined to or proposed to, conduct, support or allow an action which may affect the marine environment, the Federal agency shall consider alternatives to avoid adverse effects on the marine environment. If the agency finds that there is no practicable alternative consistent with the law, the Federal agency shall modify its actions to the extent consistent with law to minimize the potential adverse effects in the marine environment.

OCEAN DUMPING PENALTIES

SEC. 16. Section 105(b) of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1415(b)) is amended to read as follows:

"(b) In addition to any action which may be brought under subsection (a), any person—

"(1) who knowingly violates this title, regulations promulgated under this title, or a permit issued under this title shall be fined under title 18, United States Code, or imprisoned for not more than 5 years, or both; and

"(2) convicted of such a violation shall forfeit to the United States any property constituting or derived from any proceeds the person obtained, directly or indirectly, as a result of such violation, and any of the property of the person which was used, or intended to be used in any manner or part, to commit or to facilitate the commission of the violation.".

AUTHORIZATION

SEC. 17. (a) AUTHORIZATION.—There are authorized to be appropriated the following sums to carry out this Act:

(1) $30 million to the Environmental Protection Agency for fiscal years 1990, 1991, 1992, 1993, and 1994;

(2) $15 million to the Undersecretary for fiscal years 1990, 1991, 1992, 1993 and 1994;

(3) $40 million to the Administrator to issue grants to states for fiscal years 1990, 1991, 1992, 1993, and 1994 to develop and implement management strategies for marine areas in need of protection pursuant to section 304(n) of the Federal Waters Pollution Control Act. The amount of grants to any state shall not exceed 50 per centum of the costs of the program and the non-Federal share of such costs may not be provided from any Federal source.

(b) ELIGIBILITY FOR STATE REVOLVING LOAN FUNDS.—(1) Section 601(a) of the Federal Water Pollution Control Act is amended by striking "and (3)" and inserting in lieu thereof:

"(3) for developing and implementing a conservation and management plan under section 320, (4) for developing and implementing a management strategy under section 304(n), and (5) implementing a marine combined sewer overflow correction program.".

(2) Section 603(c) of the Federal Water Pollution Control Act is amended by striking "and (3)" and inserting in lieu thereof:

"(3) for developing and implementing a conservation and management plan under section 320, (4) for developing and implementing a management strategy under section 304(n), and (5) implementing a marine combined sewer overflow correction program.".

(c) GRANT ASSISTANCE.—Section 201(n)(2) of the Federal Water Pollution Control Act is amended—

(1) by inserting "sediment quality, fishery quality and floatable" after the first time the word "quality" is used;

(2) by deleting "subject to lower levels of water quality"; and

(3) by striking the last sentence and inserting in lieu the following: "Such assistance shall be provided only for implementation of marine combined sewer overflow elimination permit approved pursuant to section 402(o) of this Act. The Administrator shall allocate available funds to address the most significant water pollution problems and shall give priority to municipalities discharging into marine areas in need of

protection designated pursuant to section 5 of the Comprehensive Ocean Assessment and Strategy Act. The amount of grants to any municipality under this subsection for a fiscal year shall not exceed 50 per centum of the costs of a project and shall be made on the condition that the non-Federal share of such costs are provided from non-Federal sources.".

○

PROTECTION OF MARINE AND COASTAL WATERS

TUESDAY, JULY 25, 1989

U.S. SENATE, COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, SUBCOMMITTEE ON SUPERFUND, OCEAN, AND WATER PROTECTION, AND SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION,

Washington, DC.

The subcommittees met, pursuant to recess, at 9:34 a.m., in room 406, Dirksen Senate Office Building, Hon. Max Baucus [chairman of the Subcommittee on Environmental Protection] presiding.

Present: Senators Baucus, Moynihan, Graham, Mitchell, and Symms.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. The hearing will come to order.

Good morning, ladies and gentlemen. Welcome to the second of two hearings on legislation to expand and strengthen research and protection of our marine and coastal waters.

At our first hearing on July 12th we had a good discussion of coastal protection issues, and I look forward to continuing that discussion today.

A witness at our first hearing, Mr. Howard Levenson of the Office of Technology Assessment, gave us a clear warning. He stated that "many U.S. estuaries and coastal waters will continue to degrade or begin to do so during the next few decades unless additional protective measures are taken."

The witness for the National Oceanic and Atmospheric Administration concluded that "the extent of the coastal pollution problem is truly national and not limited to a few specific coastal or estuarine areas."

A number of constructive suggestions were offered at the earlier hearing by States, by environmental groups, and by witnesses representing the fishing and tourist industries. It is clear from the hearing that there is a growing consensus about the need to address coastal pollution problems, and that there is special interest in developing preventive measures to protect areas that are not now heavily degraded.

Today we will hear from the Environmental Protection Agency; the Corps of Engineers; and representatives of ports and municipalities, as well as from the scientific community. We look forward to hearing from all of our witnesses.

I will chair this morning's hearing for a while. Senator Graham of Florida has kindly consented to take over at a later time, when Senator Moynihan and I must leave for the Senate Finance Committee's markup of the debt ceiling bill. Senator Lautenberg, who is cochairing these hearings, will arrive later this morning.

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator MOYNIHAN. Mr. Chairman, could I make just a brief statement?

Senator BAUCUS. Certainly.

Senator MOYNIHAN. Just a note that one of the bills under consideration is S. 1210, which is a bill that a number of us have introduced to establish a national survey or assessment of the nature and extent of aquatic sediment contamination in the country, the National Sediment Contamination Survey. This addresses a subject that we have been getting to for a decade now. Since the time we established the Superfund to deal with toxic wastes, we began with an on-land, dry-fill setting which, curiously, was the remains of what was to have been a canal, and we have stayed with soil impact, soil-surrounded waste situations, and have more or less completely avoided the settings where the toxic wastes involved were at the bottom of a lake or in a river bed.

I think anyone familiar with the pattern of dealing with and disposing of, effluent in the industrial age would recognize that the site of choice was water. If you had the option—and you did; I don't think there are more than two cities in America that aren't built on a river, or else they don't grow, but they are built on a river or on the ocean, principally because that's how you got there, but once you got there they stayed there. Water was the mode of transportation that got you there, and once you got there the great advantage of the site was that you could dispose of wastes by dumping it in the water and it disappeared. It didn't always disappear far, but it was out of sight. And this is an age in which the implications are complex and the cost benefits are complex, but anyway, it happened.

"It" happened. Just exactly what "it" is, we don't know. You heard me, perhaps to the point of distraction, talking about our Onondaga Lake, which I do because it's a nice example. The Solvey process which produces soda ash, which in turn made possible the mass production of Mason jars, which was basic to the economy of the 19th century—it began in Solvey Village on the shores of Lake Onondaga, which is basically the city of Syracuse. In 102 years, the waste deposited in Onondaga Lake took up as much, we think, as a third of the volume. Most of it involved mercury and such like.

How do we deal with that? We don't know. We don't know, one, what's there; but much more importantly, we don't know the technology. We haven't developed it for actually removing and recycling. We have problems all over the country with very small areas where PCBs have been dumped. When PCBs were dumped over 50 years ago, they were thought to be inert and innocuous matter; we now think otherwise. I'm not sure how much we know, but we have established that you can't dredge them up because you can't find a place to put them, and hence water sources tend to get more extensively polluted.

There is a good rule, that you never do much about a subject until you learn to measure it, and S. 1210 is an effort to begin measuring the extent of underwater toxic waste sites in the country—rivers, oceansides, and lakes.

We are deeply pleased that we have this morning a representative of the Corps of Engineers, who will be our second witness. I think the Corps probably has the most experience of any group with this through dredging, with which it has been involved for a century and a half, and I think it would be an ideal agency—or with EPA as the lead agency—in carrying this out. We're not talking about large sums but we are talking about a very large issue which we're never going to address if we don't get some fix on just what kind of issue we're dealing with and how big an issue it is.

Senator BAUCUS. Thank you, Senator. That's very interesting. I didn't realize that a third of a lake outside of Syracuse——

Senator MOYNIHAN. One of the few proofs that we have of advancing in the environmental effort is that Lake Cuyahoga in Cleveland no longer catches fire regularly; 20 years ago, it did.

Senator BAUCUS. Thank you, Senator.

Senator Mitchell.

OPENING STATEMENT OF HON. GEORGE J. MITCHELL, U.S. SENATOR FROM THE STATE OF MAINE

Senator MITCHELL. Mr. Chairman, I thank you for holding this hearing and, along with Senator Lautenberg, an earlier hearing on the important problem of coastal pollution.

There is a growing consensus that we must expand and strengthen programs for protection of coastal waters. Just yesterday the Governors of eight coastal States came to Washington to meet with Members of Congress, including Senator Lautenberg and myself, to review programs in addressing coastal problems and to share ideas about what needs to be done to protect this vital resource.

As part of that meeting we agreed to a general agenda of steps to protect the coastal environment. The agenda addresses a number of issues being considered at this hearing.

If there is no objection, Mr. Chairman, I ask that a copy of the agreement with the Governors be included in the hearing record.

Senator BAUCUS. Without objection.

[The agreement follows:]

CONGRESSIONAL--STATE ACTION AGENDA TO PROTECT AND PRESERVE OUR COASTS

From our coastal waters come food for our table, recreational opportunities, and employment for many coastal residents. Our economy, culture and our very survival depend on our ability to preserve and protect this valuable resource.

Our coastal waters and the Great Lakes are in jeopardy. They have fallen victim to a variety of unwanted by-products of modern society -- toxic pollutants from industrial facilities and municipal sewage treatment plants; pesticides and heavy metals carried by runoff from farms and city streets; nitrogen and sulfur deposits carried by polluted air; contaminated sediments that poison the bottoms of bays and harbors; and the steady development of coastal areas which threatens vital habitat.

For centuries, we have seen the oceans as vast and limitless. But continued pollution is taking a heavy toll. Litter, waste, and oil desecrate our shores and foul our waters. Our coastal waters are the dumping ground for over 6 trillion gallons of sewage and industrial wastes. It is a daily assault on our waters thousands of times greater than the recent oil spill in Alaska.

These pollution problems are not limited to one coast or region. Polluted waters, contaminated sediments, closed shellfish beds, and the explosion of coastal development are problems we all face.

Each of us is separately pursuing legislation, policies and programs to better protect the coastal environment. In recent years, Congress has enacted major new coastal protection statutes, including the Clean Water Act amendments and the Ocean Dumping Ban Act. The States have developed innovative and aggressive programs to improve coastal protection, including programs to cut nutrient pollution, educate the public, and restore vital habitat.

Congress is now considering several major legislative proposals to expand and strengthen marine research and protection programs. The State Governors are building on recent accomplishments and have developed a coastal protection policy. These efforts are intended to provide a long-term, comprehensive response to coastal pollution problems.

We are working to build a stronger Congressional/State partnership to support and foster these coastal protection initiatives. This Coastal Protection Agenda is a statement of our commitment to coastal protection and our determination to provide the protection our coastal waters deserve. Specifically, we look to the following goals to protect this vital resource --

1) Create an Environmental Ethic

- Federal and State policies must reflect the need for strengthened environmental protection.
- Education and public participation must be strengthened to show how everyone can participate in the solution to coastal pollution problems.

2) Strengthen Research and Monitoring of Coastal Waters

- New regional research and monitoring must be conducted to provide essential information on the health of coastal ecosystems.
- Information sharing among all levels of government and with research institutions must be improved to give all decision-makers the tools they need to restore coastal waters.

3) Reduce Coastal Nutrient and Toxic Pollution

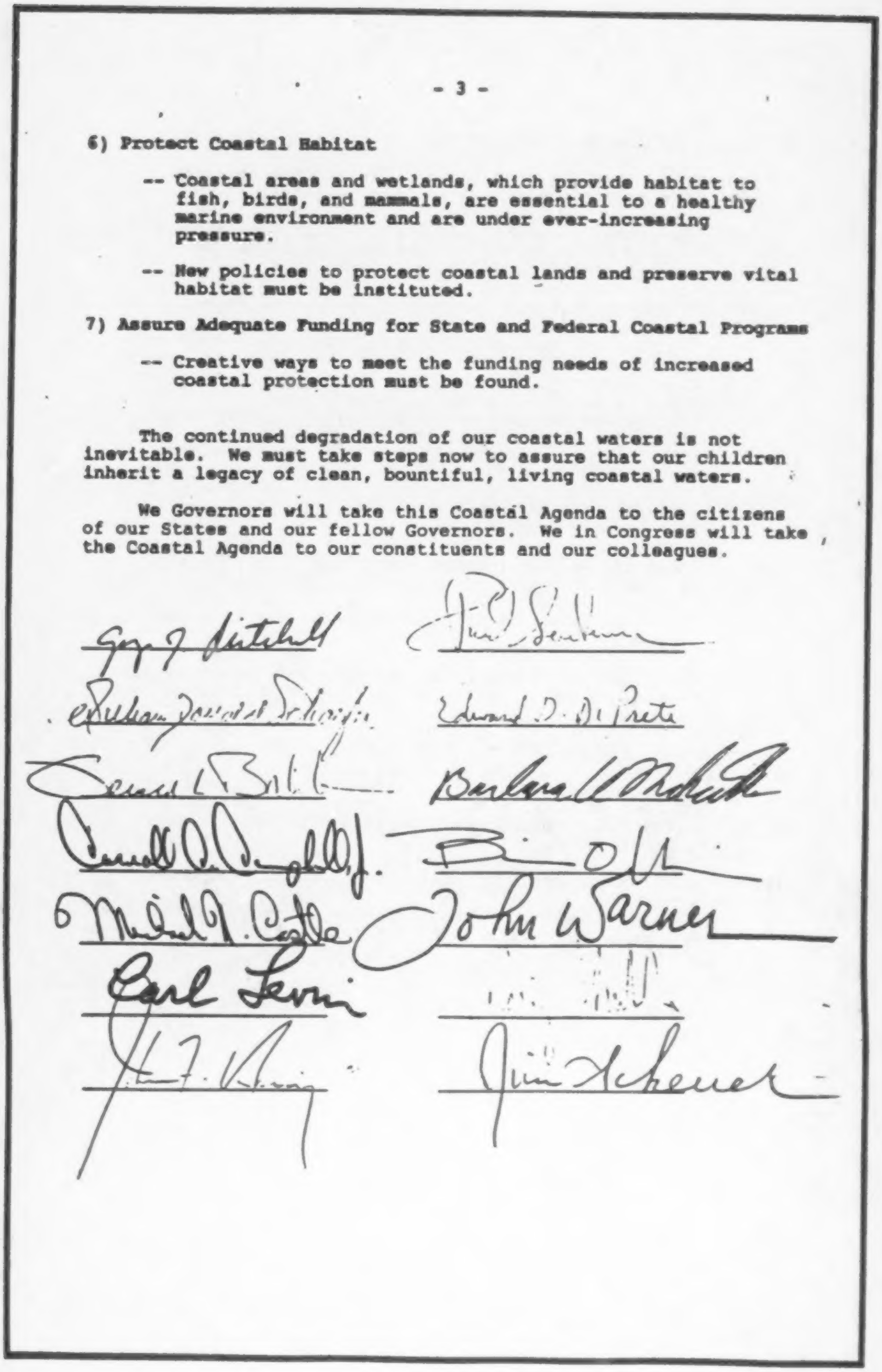
- New policies must be established to better control industrial and municipal discharges of toxics and nutrients.
- Enforcement and compliance with existing laws must be improved.
- The Clean Air Act must be reauthorized and expanded to better control airborne deposition of pollutants in coastal waters.

4) Protect Marine and Coastal Sediment Quality

- New efforts are needed to identify toxic contaminants in marine and Great Lakes sediments, to address these pollution problems, and to prevent future sediment contamination.

5) Expand Authority for Oil Spill Prevention and Response

- The recent oil spill in Alaska is dramatic evidence of the need for more effective programs for preventing and responding to major oil spills.
- The Federal government and State governments must improve programs to prevent and respond to major oil spills.



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6) Protect Coastal Habitat

-- Coastal areas and wetlands, which provide habitat to fish, birds, and mammals, are essential to a healthy marine environment and are under ever-increasing pressure.

-- New policies to protect coastal lands and preserve vital habitat must be instituted.

7) Assure Adequate Funding for State and Federal Coastal Programs

-- Creative ways to meet the funding needs of increased coastal protection must be found.

The continued degradation of our coastal waters is not inevitable. We must take steps now to assure that our children inherit a legacy of clean, bountiful, living coastal waters.

We Governors will take this Coastal Agenda to the citizens of our States and our fellow Governors. We in Congress will take the Coastal Agenda to our constituents and our colleagues.

George J. Mitchell

William Donald Schaefer

Edward D. DiPrete

Barbara A Mikulski

Carroll A. Campbell Jr.

Michael N. Castle

John Warner

Carl Levin

Jim Scheuer

John Glenn

Jim Martin

Chuck Robb

Frank R Lautenberg

Senator MITCHELL. In addition to addressing the general coastal pollution issues which were discussed at the July 12th hearing, today's hearing will focus on legislation I have proposed to establish regional marine research programs. The Marine Research Act, S. 587, provides general authority for 10 multi-State regional marine research programs which would support and coordinate marine research at the regional level. Regional research programs would be operated by groups of research institutions in each region, including universities, State agencies, and private laboratories. Each region is to develop a three-year plan for research and monitoring in the coastal waters of the region and would be eligible for basic support grants of up to $3 million a year.

This regional research and monitoring program will help to build the necessary scientific foundation we need to understand the marine environment and to design and implement pollution control measures over the long term.

I look forward to working with you, Mr. Chairman, and other members of the committee in developing the best possible legislation to support marine research and to expand and improve programs for reducing coastal pollution.

Mr. Chairman, unfortunately I will not be able to stay for the hearing.

Senator BAUCUS. Thank you, Senator.

Senator Graham, do you have a statement?

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Senator GRAHAM. Thank you, Mr. Chairman. I commend you for holding this hearing, with Senator Lautenberg, and look forward to this committee coming forward with some public policy on this critical area.

I have a statement I would like to submit to the record; but to add to that, I believe that it's very important that we, in this committee, develop an approach to the issue which recognizes that we are going to apply this scientific knowledge which will be generated by the various research proposals to the development of enhanced public policy. Our goal is not as theorists but as men and women who have a public responsibility. In doing that, I believe that it is important that we be goal-oriented in our research in terms of attempting to establish what we would like the shape of the American marine environment to be as we enter the 21st century. What is our objective? And then, how do we develop an integrated approach, recognizing the complexity and diversity of items, entities, institutions, and pre-existing conditions that will affect the ability to achieve that goal?

One of the factors that we must deal with is some new approaches to public administration. There is a tendency to deal with these issues within the constraints of pre-existing political boundaries, whereas the reality of the science and the impact does not follow those boundaries.

I would suggest to the committee that there are some areas in which we can look for experience and wisdom in similar fields. For example, the Endangered Species Act has utilized a very creative process of planning on an area-wide basis that has been valuable in my State and others in attempting to deal with that issue.

There are a number of State laws that have developed comprehensive planning processes for multifaceted geographic areas not dissimilar to those that are going to be required in dealing with our near ocean.

Senator BAUCUS. Could I ask the Senator if he would not agree that the Estuary Law which we passed about 10 years ago has proved very successful in this kind of thing?

Senator GRAHAM. I believe that is another area in which we can look for some experience that may be applicable to approach constructive public policy in this field.

Mr. Chairman, we have a challenging but exciting and very stimulating task ahead of us, and I look forward to today's hearing.

[Senator Graham's statement follows:]

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Good morning. Today's joint hearing of the Environmental Protection and the Superfund, Ocean and Water Protection Subcommittees is the second of two hearings on several pieces of legislation to expand and strengthen protection and research of marine and near-coastal waters.

Dr. Levenson testified at our July 12 hearing that the Office of Technology Assessment's report on wastes in marine environments found that, and I quote: "Many U.S. estuaries and coastal waters will continue to degrade or begin to do so during the next few decades unless additional protective measures are taken."

Since the report's release in April 1987, we have seen that deterioration continue, experiencing wastes washing up on our shores, oil spills degrading the coastlines, and sewage and stormwater outfalls polluting our bays, estuaries, and near-coastal waters.

Estuaries and coastal waters are the most important of all marine environments, according to Dr. Levenson, especially with respect to ecological roles, recreational uses, and commercial resources. For most coastal communities, commercial and recreational uses of the coastline and coastal waters make up a large percentage of industry.

My State of Florida depends on tourism as well as commercial and sport fishing to maintain a thriving economy. Coastal degradation has the potential of significantly affecting that economy. With approximately 1,200 miles of coastline, Florida must examine means by which to prevent onshore pollution from washing into coastal waters as well as stopping offshore pollution which washes up onto our shores and into our bays and estuaries.

To address this growing problem, we must fulfill our commitment to sewage treatment grants and revolving loan funds to assure the degree of treatment that will prevent degradation. We must require aggressive implementation and enforcement of nonpoint source pollution programs to minimize the runoff from roads, fields, and other sources of pollution. We must encourage State and local governments to regulate prudent uses of land so that unnecessary erosion of the shoreline and sewage and disposal pollution do not degrade our coasts.

We must stringently enforce outer continental shelf regulations to prevent the water and air pollution that can result from these activities. The Department of the Interior has failed to issue civil penalties on outer continental shelf source violations since 1983.

We must assure adequate environmental safeguards in exploration and drilling offshore, as well as in shipping hazardous cargo through coastal waters. We must stringently enforce disposal laws to keep medical and other waste from entering our seas.

These are just a few aspects of coastal protection and research that we must examine. I look forward to hearing ideas from our witnesses today on ways to prevent and mitigate coastal degradation.

I would like to extend a special welcome today to Dr. John DeGrove, a good friend of mine, who will be testifying in the second panel. Dr. DeGrove is director of the Florida Atlantic University/Florida International University Joint Center for Environmental and Urban Problems. John is an expert in many fields, including land use planning and political science. As always, John, I welcome your ideas.

Senator **Baucus**. Thank you, Senator.

With your experience as Governor of a very important State, your contribution is very helpful.

I would like to acknowledge and place in the record at this point a statement from Senator Lautenberg, who was unable to attend today's hearing.

[Senator Lautenberg's statement follows:]

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

This morning, the Subcommittees on Superfund, Ocean and Water Protection and Environmental Protection will hold the second day of hearings on four bills designed to protect our coastal and ocean waters.

These bills are S. 1179, the Comprehensive Ocean Assessment and Strategy Act or Coast which I introduced, and S. 1178, the Marine Protection Act, S. 587, the Marine Research Act and S. 588, the Marine Research Funding Act, all of which were introduced by Senator Mitchell. We also will consider S. 1210, the National Sediment Contamination Survey Act, introduced by Senator Moynihan.

We've introduced this legislation because of our concern about the health of our ocean and coastal waters. At our first day of hearings, the Office of Technology Assessment testified that the overall health of our coastal waters is still declining and without additional steps, there will be new or continued assaults on our ocean.

Virtually every other witness including representatives from the fishing and tourist industries and environmental groups agreed with this assessment and commented favorably on the legislation before the Subcommittees.

These bills adopt many of the recommendations made by OTA and others. Senator Mitchell's Marine Research Act will provide increased scientific research and assessment of our nation's coastal environment.

Both S. 1178 and S. 1179 are designed to reduce coastal pollution from industrial plants, sewage treatment facilities, combined sewer overflows, stormwater discharges and nonpoint sources of pollution. And S. 1210 will require the first comprehensive survey of contaminated aquatic sediments.

Today we will hear from Federal and local officials and representatives of sewage treatment facilities and port authorities who will discuss how the proposed bills affect their organizations. While I understand concerns about the costs of efforts to address coastal pollution, I am keenly aware of the costs of our failure to address these problems.

We also will hear representatives of the scientific community who will discuss the need for increased research and monitoring efforts.

I look forward to hearing from today's witnesses how we might improve the legislation before us.

Senator **Baucus**. I would like to turn to the first panel, which will include Ms. Rebecca Hanmer and Dr. Robert Engler.

Ms. Hanmer is with the Environmental Protection Agency and Dr. Engler with the Corps of Engineers.

I would like to inform all witnesses that there will be a time limit on the testimony of each. For the first panel, however, I would like to extend the time a bit more than for the other witnesses.

I would like each of you to please summarize your statements but you may speak up to 10 minutes. If you can shorten it, that is fine, but I will give each of you 10 minutes.

For the other panelists, it will be five minutes each.

All right, let's begin with you, Ms. Hanmer.

STATEMENT OF REBECCA HANMER, ACTING ASSISTANT ADMINISTRATOR FOR WATER, ENVIRONMENTAL PROTECTION AGENCY

Ms. HANMER. Thank you very much, Mr. Chairman.

I appreciate the opportunity to appear again to speak on this vital issue.

You have had earlier testimony from us, and also from the witnesses at your earlier hearing about the serious the problems we are addressing. Our testimony will focus on where we go from here, and we will depend on the earlier background information we have provided.

To summarize, while we have spent a lot of money on pollution control and can see some good results, we are still losing in the coastal zone, especially if you measure that loss in terms of natural resources.

I have a full statement for the record that I would like to submit, and then I will make a very brief summary, with your permission.

Senator BAUCUS. Without objection.

All statements will be automatically included.

Ms. HANMER. Thank you.

I have with me three of the office directors that are responsible in the Environmental Protection Agency for implementing programs covered by the two bills that we will be addressing today, if I may introduce them at this time.

Senator BAUCUS. Please.

Ms. HANMER. Dr. Tudor Davis is head of our office of Marine and Estuarine Protection.

Martha Prothro is head of our Office of Water Regulations and Standards, which has among other things responsibility for water quality standards.

Jim Elder is head of the Office of Water Enforcement and Permits, which is the office that administers permit responsibilities, NPDS enforcement, and which would have responsibilities for combined sewer overflows and a number of aspects of these bills.

When we are looking at the seriousness of this problem, one thing that strikes us is that the statutes that we are operating under, the Clean Water Act and the Marine Protection, Research and Sanctuaries Act, which have been amended in the last two years, are basically very sound statutes.

These statutes provide EPA and the States with strong authorities to deal with point sources of pollution. One of the things that we think is important to focus on, and the bills do this, is that any changes in point source pollution authorities, such as dealing with combined sewer overflows, should be designed so that the very high level of activity already underway under these recently amended laws are reinforced.

That is something we feel very strongly about, because of the resource implications of a number of the features of the bills being discussed.

In our work in the Environmental Protection Agency, we have decided to focus on a blueprint, a National Coastal and Marine Policy, which we developed last year, and which Administrator Reilly recently reaffirmed. When we are addressing what needs to be done, it will be from the standpoint of the Agency's National Coastal and Marine Policy.

One of the major things in the policy is its focus on developing new institutions of government or new ways for the existing institutions of government to relate to each other.

The National Estuary Program, which now has programs underway in 12 estuaries, with plans for four more, is not only an environmental protection program for us. It is also a laboratory to look at how we can integrate Federal, State and local governmental action, universities, the business community and the environmental community to devise the kinds of solutions we believe are going to be necessary to address the coastal pollution issues and related habitat issues.

At present, we are thinking of stopping essentially where we are with the number of new national estuary projects—at 16, or going only a little bit beyond that, in order to focus on coast-wide planning aspects which we are calling a Near Coastal Water Strategy.

We have developed a framework program for doing this in the Gulf of Mexico. We have a pilot program for New England. We would ask that as the committee looks at such features as designation of areas to be protected—both clean areas to be protected and polluted areas to be focused on—and development of new standards, and that the Committee also we take a look at the experience that we are now having, both with the National Estuary Program and with the Near Coastal Water Strategy as we begin to develop ways to link these estuary programs together.

Again, we urge you to reinforce the good ideas that are now being developed through these programs, as opposed to creating new mandates which may dilute resources or inadvertently draw attention away from these successful models.

The strong attention to point source are further reinforced by the bills that are the subject of this hearing. Frankly, we think that this is not the area of highest priority attention right now.

There is remaining unfinished business with point sources, clearly with regard to combined sewer overflows, that we must deal with with some urgency. But we feel an even greater urgency regarding he successful implementation of the nonpoint source program.

This is an area where we have not nearly been so successful, either in the past or at present. And as we are looking at what needs to be done in the coastal zone, I think priority attention needs to be paid to what experience we are having, working, to how well the State nonpoint source programs are to what difficulties the States are having in developing these programs, and to what they think needs to be done to strengthen them.

All of the controls that we can put on point sources are really not going to be effective in dealing with this problem without best management practices and land use measures that are part of a well-rounded, nonpoint source program.

So we believe that a nonpoint source program is one of the two critical areas, if you will, missing pieces, in our efforts to protect coastal resources.

The second missing piece clearly is the protection of aquatic habitat. Our pollution control programs—after a great deal of expenditure—really will not reap the anticipated benefits unless at the same time we are able to strengthen our protection of the aquatic and wildlife habitat.

Burgeoning growth in the coastal zone and land use and land management practices all the way from urban development to agriculture are having critical effects on wetlands and other habitat resources. We believe this is an area that needs to be focused on. We are doing so in keeping with the recommendations of the National Wetlands Policy Forum.

A third major point that we would like to make is that adequate program resources are critical. As I have pointed out, the Clean Water Act and the ocean dumping responsibilities have both been enhanced in the last few years.

However, at the State and local level especially the governments are struggling to find enough resources.

Significant resources are going to be needed to finance coastal water monitoring, new scientific developments such as those mentioned in the bill—sediment criteria biological indicators.

Also, significant resources will be required to finance control technologies such as storm water and CSO controls and pollution prevention options. Any effort that we make to protect the coastal areas needs to focus on how the resources will become available at the Federal, State and local levels to carry out these mandates.

In that regard, at an earlier hearing on the Water Quality Act, Senator Chafee raised the issue of fees and other innovative financing mechanisms.

In response to that, and also in response to our own studies, we have recently set up a work group to look at different kinds of fee systems at the Federal level. We have been focusing on technology transfer at the State level. We would be pleased to work with the committee and the Congressional Budget Office and others on innovative ways to finance some of these programs.

One of the things that we have learned from the National Estuary Program—and it gets to a point you made earlier, Senator—is that to successfully address coastal pollution and habitat loss, we really have to mobilize all levels of government. Especially we must mobilize local government and broaden our base of support and activity in environmental protection.

To create an incentive for involving local governments, as well as to ensure effective solutions to the different kinds of problems that each of these coastal areas gives us, we believe any coastal legislation has to allow sufficient flexibility for the Federal agencies and the States and localities to design solutions to local and regional problems.

In many cases, local grassroots efforts will be vital if we are to develop and fund the solutions that will save the coastal areas. To focus in through Federal legislation on just a few of the types of problems, such as contaminated sediments, or combined sewer overflows, and force the bulk of the expenditures to these areas, may be counterproductive in many localities with a variety of problems.

So, we think it is extremely important to have some flexibility for the programs, either programs like the National Estuary Program or the State Coastal Zone Management Program—to design solutions that fit the problems at hand.

And finally, we agree with the committee that national leadership from both the Congress and the Executive Branch will be necessary if we are to implement our National Coastal and Marine Policy and the committee is to achieve its goals.

Strong commitments from a full array of Federal departments and agencies will be necessary if we are going to effectively complement these local and State efforts.

I note that the Corps of Engineers is here today; we are working very closely together on these issues. These are issues that the Agriculture Department and a number of agencies will have to contribute to, if we are to be successful.

Thank you very much for allowing me to address you, and I will be glad to answer any questions I can.

Senator Baucus. Thank you, Ms. Hanmer.

Mr. Robert M. Engler, Waterways Experiment Station, U.S. Army Corps of Engineers.

STATEMENT OF ROBERT ENGLER, DEPARTMENT OF THE ARMY, OFFICE OF THE ASSISTANT SECRETARY FOR CIVIL WORKS

Mr. Engler. Thank you, Mr. Chairman.

I am Bob Engler. I am senior scientist with the Corp's Waterways Experiment Station, which is our central research facility dealing with contaminated and non-contaminated sediments that we handle in our regular dredging mission.

I am pleased to be here on behalf of Assistant Secretary Page to discuss issues raised in your letter of invitation.

We have submitted detailed testimony for the record, and with your permission, I will just spend a few minutes summarizing some of the key points.

In these opening remarks, I wish to briefly discuss the serious technical problems that the Corps has regarding proposed numerical sediment quality criteria, and I will also take some time to advise you of our significant experience in assessing, regulating and managing contaminated sediments.

Just what is technically wrong with the numerical sediment criteria? Frankly, there is no scientific or technical basis whatsoever, at the current time, to support the application of sediment quality criteria to any regulatory program that the Corps is involved with.

There are a number of technical reasons, and they are very significant reasons. The geochemical complexity of natural and contaminated marine systems prohibits the development of cause and effect relationships between a single contaminant or a group of contaminants, a potentially impacted site—be it the site where the sediments reside—a proposed aquatic, near shore or upland site, and the target organisms that reside at these sites.

There are numerous physical chemical, geochemical and biochemical factors that regulate the toxicity and the biological availability of sediment-bound contaminants. Some of these are pH, salinity, redox potential—that's the potential to be aerated or not aerated—clay mineralogy, organic matter content, sand silt and clay content.

Overlaid with these and other intrinsic sediment characteristics are the characteristics of the harbor, the watershed characteristics, the characteristics of point and nonpoint sources affecting or impacting these harbor or sedimentary areas, and the disposal site characteristics, be it an open water site, a near shore site, an upland site. These have a profound impact on the fate and effect of contaminants associated with sediments.

The target organisms themselves are not affected the same way by sediment bound contaminants. Even the same species in different geographical locations respond differently to these contaminants.

Overlaid on this are interactions among the contaminants themselves, synergistic effects that can enhance or increase toxicity by combining contaminants. Therefore, a single numerical standard for any single contaminant would not address these concerns.

Added to this complexity is the fact that these and many other factors vary widely among harbors and within individual locations within a harbor. Sediments also exhibit unique contaminant binding capacity for toxic metals and organics, significantly limiting their toxicity and bioavailability. These binding characteristics of sediments, of course, can be exceeded in highly contaminated areas.

As I noted earlier, organisms vary widely in response to these contaminated sediments. Because of these complex interrelationships, science has been unable to develop numerical sediment quality criteria that quantify the cause and effect relationships necessary in making critical regulatory decisions, and how we manage and handle these contaminated sediments.

These concerns, sir, not only have received significant attention from the Federal agencies, the Corps, EPA, and others, but are also receiving concern from the National Academy of Sciences and Engineering, the Marine Board, EPA's Science Advisory Board, a number of professional societies—and they, too, have noted these difficulties.

As far as our R&D initiatives, over the past two decades we have conducted significant research in support of our regulator mission and specifically with contaminated sediments and in support of our dredging mission. Pursuant to the Clean Water Act, Marine Protection Research and Sanctuaries Act, the Corps in conjunction with EPA has developed a preferred approach in addressing contaminated sediments—and clean sediments, for that matter.

This approach is an effects-based approach to assess and manage these sediments using a combination of chemical analyses and biological assessments. These approaches include international constraints placed upon us by the London Dumping Convention.

We have applied these techniques and approaches over a wide range of sediments and sediment types. Moreover, Mr. Chairman, we have verified these approaches to measure the level of protection gained from the application of these and a number of other state-of-the-art techniques for addressing contaminants.

The effects-based approach fully addresses the technical complexities that I previously mentioned, as well as the fact that they address mixtures of chemicals that can act synergistically. These comprehensive approaches that I have just touched on are embodied in the Corp's dredging regulations, our testing and management strategies that have been published as policy by the Corps, and the joint Corps-EPA manuals.

The present Clean Water Act and Marine Protection Research and Sanctuaries Act as structured allow for an effective, yet flexible, management of dredged material, and any changes to these Acts should maintain this flexibility.

Lastly, sir, the Corps has a demonstrated capability in managing these highly contaminated sediments, even sediments such as found in designated Superfund sites.

As an example, cooperatively with EPA, we have just recently completed a significant field demonstration of clean-up techniques for the highly contaminated sediments of New Bedford Harbor, Massachusetts.

Mr. Chairman, the Corps has serious technical concerns regarding the environmental deficiencies of numerical sediment criteria in relation to our regulatory program. On the other hand, we are confident that we are using, and through our research will continue to develop, technically sound and environmentally protective assessment protocols.

We can, sir, satisfactorily regulate and manage contaminated sediments.

Thank you for your attention, and I am prepared to response to your questions.

Senator **Graham** [chairing]. Thank you very much, Doctor.

I would like to ask a question of Ms. Hanmer, and I am going to be asking this question throughout the morning.

What is your description, with as much quantification as possible, of what you believe our national goals should be in coastal protection from now until the year 2000?

Ms. **Hanmer**. One of the basic prescriptions is exemplified by the wetlands forum recommendation to commit ourselves to no net loss of wetlands. We would go beyond that to identify other valuable aquatic habitat areas where a short term goal should also be no net loss.

We would then begin to turn around some of the coastal natural resource losses as a longer term goal including both coastal and inland wetland losses. I think that should be part of any coastal program.

In terms of discharges, I do not know whether or not "no net increase"—which one of the bills talks about—for all pollutants is necessary. Certainly for certain pollutants that bioaccumulate in fish flesh, or that are highly toxic, we should consider a "no net increase" approach, and then begin to roll back the existing discharge levels of such pollutants.

In terms of management structures, I think we would like to see fully operating programs like the coastal zone management programs in all of the coastal states, working with the State nonpoint source programs to design and implement the kinds of land management measures necessary to protect habitat and to achieve coastal water quality goals—essentially fully functioning programs in all States.

Those are the three top issues we have on our minds.

In some of the National Estuary Programs, more specific goals are being designed such as no net increase in storm water runoff. Sarasota is an example. There are going to be many individual areas as we stated in our testimony, that should design their own prescriptions like this, depending on the types of habitat they have and the types of pollution problems they have.

The overall message is let us not let it get any worse and let us start to roll it back as quickly as we can.

Senator **Graham**. I am going to make this offer to each person that I ask a similar question, if you would like to supplement your answer to that question for the record, please do.

I am particularly interested in a performance based response, that is, in the year 2000, we could go out and evaluate the resource. What should we look to the health of the resource as an indication that our various processes have in fact achieved their goals?

Ms. **Hanmer**. We would be glad to do that.

We actually address that issue in our National Coastal and Marine Policy, so I will submit that for the record as well as the substantiating material regarding biological integrity of aquatic organisms, and restoring full uses of our beaches.

[The following was supplied for inclusion in the record:]

[From EPA Journal, May/June 1989]

MEASURING FOR ENVIRONMENTAL RESULTS

(By William K. Reilly)

First, the good news: Based on my years in the environmental movement, as well as my first four months as EPA Administrator, I believe EPA has the most talented, most dedicated, hardest-working professional staff in the federal government. What's more, I think this Agency does an exemplary job of protecting the nation's public health and the quality of our environment.

Now the bad news: I can't prove it.

I could cite facts and figures telling how many regulations and permits we've written since 1970, how many enforcement actions we've taken, how many lawsuits we've defended, how many chemicals we've tested, how many reports we've published. But what do all those activities add up to? Do they show that EPA is accomplishing its mission—or do they just show that we've managed to keep busy for the last 18 years?

By listing our activities we do not necessarily prove we're doing a good job. When it comes to environmental protection, the best measure of our success must be results. Is the public healthier than it was 18 years ago? Is the environment cleaner? The limited evidence we have is mixed and inconclusive; we really don't know how far we've come—or how far we still have to go.

Thus, as I begin a challenging assignment as manager of this vital agency, one of my first priorities is to build on the work of my predecessors in strengthening our ability to track the nation's, and EPA's, progress in cleaning up the environment.

A key element in any effort to measure environmental success is information—information on where we've been with respect to environmental quality, where we are now, and where we want to go. Since its beginning, EPA has devoted a great deal of time, attention, and money to gathering data. We are spending more than half a billion dollars a year on collecting, processing, and storing environmental data. Vast amounts of data are sitting in computers at EPA Headquarters, at Research Triangle Park, North Carolina, and at other EPA facilities across the country.

But having all this information—about air and water quality, about production levels and health effects of various chemicals, about test results and pollution discharges and wildlife habitats—doesn't necessarily mean that we do anything with it. The unhappy truth is that we have been much better at gathering raw data than at analyzing and using data to identify or anticipate environmental problems and make decisions on how to prevent or solve them. As John Naisbitt put it in his book *Megatrends:* "We are drowning in information but starved for knowledge."

Our various data systems and we have hundreds of them, are mostly separate and distinct, each with its own language, structure, and purpose. Information in one system is rarely transferable to another system. I suspect that few EPA employees have even the faintest idea of how much data are available within this Agency, let alone how to gain access to it. And if that is true of our own employees, how must the public feel when they ponder the wealth of information lurking, just out of reach, in EPA's huge and seemingly impenetrable data bases?

One of the main reasons for the proliferation of compartmentalized data bases can be found in our history. Congress created EPA by linking together several different agencies and bureaus, each with its own media-specific environmental legislation of the 1970s only heightened the fragmentation by assigning EPA's pollution control responsibilities according to environmental medium or category of pollutant—air, water, solid and hazardous wastes, pesticides and toxic substances, and so on. Each program office, in pursuing its own distinct legislative mandate, has created and maintained its own unique information systems, geared to that program's specific needs and regulatory approaches. Until recently, few attempts have been made to generate or use data across programmatic lines.

This must change. EPA must take a strategic, "big-picture" approach to the collection and use of environmental data. Our knowledge and technology have matured to the point where we can not only integrate EPA's various data systems, but we can also combine our data with information from other sources to create elegant, information-rich pictures, or models, of the environment as a whole.

Using powerful new supercomputers, for example, we can create global and regional climate models that use existing data to help predict the effects of heat-trapping "greenhouse" gases and ozone-depleting chlorofluorocarbons in the atmosphere. Within a few years, as the next generation of ultra-fast computers becomes available, these models will become more and more precise and useful in projecting future trends.

On a somewhat more modest scale, EPA is developing geographic information and environmental modeling systems which combine many different kinds of data—population density, meteorologic and topographic data, location of drinking water aquifers, etc.—to identify sensitive populations and ecosystems which may be at risk from pollution. One example among many is the Office of Research and Development's proposed Environmental Monitoring and Assessment Program [EMAP], which would improve EPA's ability to assess the effects of specific pollutants on ecosystems, as well as the impact of EPA programs on mitigating any adverse effects.

All EPA programs must begin looking for creative new ways to make use of the information gathered by their counterparts in other programs and agencies—as well as new, multimedia data such as the toxic chemical release information now available through the Emergency Planning and Community Right-to-Know Act of 1986. This information can be invaluable in helping to define total pollutant loadings in this country—as well as the effectiveness of our efforts to minimize them. It can also help us improve our ability to anticipate and head off future environmental problems.

The Agency's new Information Resources Directory, which lists and briefly describes all of EPA's data systems as well as other information sources, is a step in the right direction. So is our new Comprehensive Assessment Information Rule (CAIR), which allows all EPA programs and other federal agencies to obtain the information they need on the manufacture, importation, and processing of chemicals of regulatory interest. The strategic information effort I have described, however, will require a new attitude on the part of *every* EPA program manager—a willingness to break out of the traditional constraints of media-specific and category-specific thinking.

A number of suggestions have been made for ways to institutionalize this strategic approach to environmental data, both to improve our existing activities and to identify areas that are not being addressed. One such idea is a proposal to create within EPA a semi-independent Bureau of Environmental Statistics, which would be charged with overseeing the collection, analysis, and dissemination of environmental data. Another proposal, made last fall by the Research Strategies Committee of EPA's Science Advisory Board, is the creation of an Environmental Research Institute. Among other things, the Institute would conduct ecological research and monitor and report annually on overall environmental conditions and trends. These and other suggestions should be given careful consideration as we look for ways to focus our resources where they can have the greatest impact on reducing environmental risk.

Just as important, we must find ways to share our data more effectively with the people who paid for it in the first place: the American public. Eventually, as EPA makes progress in standardizing and integrating its information systems, the information in those systems—apart from trade secrets—should be as accessible as possible. Such information could be made available through on-line computer telecommunications, through powerful new compact disc (CD-ROM) technologies, and perhaps a comprehensive annual report on environmental trends.

Sharing information with the public is an important step toward establishing a common base of understanding with the American people on questions of environmental risk. As the recent furor over residues of the chemical Alar on apple products shows, there can be a wide gap between public perceptions of risk and the degree of risk indicated by the best available scientific data. When this happens, government can become preoccupied with responding to public outrage over sensational, well-publicized hazards at the expense of dealing effectively with less obvious, but perhaps more significant, risks to public and environmental health.

EPA must share and explain our information about the hazards of life in our complex industrial society with others—with other nations, with state and local governments, with academia, with industry, with public-interest groups, and with citizens. We need to raise the level of debate on environmental issues and to insure the informed participation of all segments of our society in achieving our common goal: a cleaner, healthier environment.

Environmental data, collected and used within the strategic framework I have described, can and will make a significant contribution to accomplishing our major environmental objectives over the next few years. Strategic data will help us:

Create incentives and track our progress in finding ways to prevent pollution *before* it is generated.

Improve our understanding of the complex environmental interactions that contribute to international problems like acid rain, stratospheric ozone depletion, and global warming.

Identify threats to our nation's ecology and natural systems—our wetlands, our marine and wildlife resources—and find ways to reduce those threats.

Manage our programs and target our enforcement efforts to achieve the greatest environmental results.

With respect to environmental data, then, our long-term goal is clear. In the future, when someone asks us if EPA has done an effective job of protecting the environment, we should be able to reply without hesitation: "You bet—and we can *prove* it!"

Senator GRAHAM. Dr. Engler, I recognize that you are here primarily because of your specific scientific background in the issue of sediment, but one concern in terms of achieving the performance goal that we will set is to have a clear understanding of what are the areas of science that need to be enhanced in order to achieve our goal.

You indicated that at this time, there was not a standard that could be applied to sediment. What importance would you place, in terms of priority, on achieving that level of scientific knowledge?

Mr. ENGLER. I would place it relatively low, far behind the need to conduct research on sub-lethal effects of contaminants in sediments, cumulative effects of the various management activities that we undertake in the coastal zone—not only dredging, but some of those management activities that EPA just mentioned.

Sediment quality criteria certainly can be a goal for the future, as we gain a much better understanding of the factors that cause sediments to affect the biota, water quality, and man, and once we understand these factors, certainly you could develop a numerical criteria or guideline to go by.

At this time, we use the knowledge of the concentration of contaminants in sediments in managing dredge material and contaminated sediments. But we use these as a guide to tell us that yes, there is contamination, and we need a more intensive testing protocol, a more meaningful testing protocol, to respond to the cause and effect relationships and requirements in the Clean Water Act and the Marine Protection Act that calls for an effects-based decision.

All the contaminants have an effect on the biota due to toxicity, bioaccumulation, and so on. So I would put the numerical sediment criteria goal relatively low in our concerns.

Senator **Graham**. Ms. Hanmer, in your comments, you alluded to the fact that there has been a lack of consistency among Federal agencies in carrying out these various plans.

You might say one of the reasons that I put such a priority on having a performance based goal is that it gives you a means by which you can evaluate whether all of the agencies responsible for attaining that goal are moving generally in the same consistent direction.

Would you suggest that there needs to be a clear definition of which Federal agency will be the primary responsible lead in attaining this national goal, and if so, would you suggest who that might most appropriately be?

Ms. **Hanmer**. I suppose if you are talking about water pollution control and water quality management then we would suggest the U.S. Environmental Protection Agency.

However, in carrying out these goals, a wide variety of activities are going to be needed—not just pollution control type activities from other Federal agencies, but changes in the way we finance Federal programs, changes in the incentives we create for development of the coastal zone or management in the coastal zone. I would say that we would favor a general goal, as you expressed, and then a collaborative process with other Federal agencies to come up with action plans to achieve that general goal.

EPA's goal would primarily be in the water quality areas that are covered by the Clean Water Act and the Marine Protection and Sanctuaries Act.

Senator **Graham** As an example of your suggestion that these issues arise in a number of forums, the Congress is now considering the reauthorization of the National Flood Insurance Protection Act, which has had an impact in terms of coastal development practices.

Has your agency commented on that reauthorization and submitted any recommendations as to how that Act might be rendered more appropriate to achieving our national coastal protection goals?

Ms. **Hanmer**. I'm not aware that we have. We are working on an interagency task force in this area, but I will check and answer for the record.

[The information requested follows:]

Question. An an example of your suggestion that these issues arise in a number of forums, the Congress is now considering the reauthorization of the National Flood Insurance Program, which has an impact in terms of coastal development practices. Has your agency commented on that reauthorization and submitted any recommendations as to how that Act might be rendered more appropriate to achieving our national coastal protection goals.

Answer. EPA is initiating discussions with FEMA to define our common interests regarding coastal development and protection. We will use these discussions to develop comments on legislation regarding the National Flood Insurance Program reauthorization.

Senator **Graham**. Does EPA consider it to be its responsibility or role to take that comprehensive monitoring of all of the various Federal initiatives that cumulatively impact on the realization of our year 2000 goal?

Ms. **Hanmer**. I would say yes, we do.

Having issued the National Coastal and Marine Policy internally, the Administrator has asked us to work with other Federal agencies to see whether or not we can be a catalyst for creating a broader Federal policy.

Part of our general environmental responsibility which we have exercised for years is to look at other Federal agency regulations and comment on them from the standpoint of their effect on the environment.

Senator **Graham**. You emphasized, and it was implicit in Dr. Engler's statement, the importance of a partnership among levels of Government—Federal, State, local. For that partnership to work, there has to be a measure of trust and credibility across those levels.

The concern that I have is that the Federal Government sets out expectations which become the basis upon which local and State governments commence their planning and their implementation, and then those expectations are dashed or trashed.

As an example, the Wastewater Treatment Act, which was passed as part of the Clean Water Act within the last two years, developed a very intricate relationship between the Federal Government and the States as we transition to the time when there will be no more Federal grants for wastewater treatment.

The first year after that agreement was struck, the recommendations of the Administration for funding were roughly half what the agreement would have called for. That caused—and legitimately so—a great deal of consternation at the State level, and basic cynicism as to what the Federal Government's real commitment was going to be.

I would suggest that as part of EPA's assuming responsibility, it ought to, in consultation with the Administration and particularly the Office of Management and Budget, review these commitments that are outstanding to the States and where they are unrealistic, come back to the appropriate authorizing committees of Congress with a statement of what is realistic, and let us have the equivalent of a domestic summit on what levels of Federal support and what extent the Federal role in this partnership will be.

Ms. **Hanmer**. We would welcome the opportunity to do that.

Senator **Graham**. Very good.

Thank you very much.

Ms. **Hanmer**. Thank you.

Senator **Graham**. The second panel represents members of the research community.

Dr. John DeGrove, director of the Joint Center for Environmental and Urban Problems at Florida Atlantic University and Florida International University.

Dr. Donald Boesch, Executive Director, Louisiana University's Marine Consortium.

Ms. Margaret A. Davidson, executive director of the South Carolina Sea Grant Consortium, and president of the Sea Grant Association.

Thank you very much for sharing your wisdom with us this morning. I would like to make some brief additional remarks about my long-time friend, Dr. John DeGrove.

We have known each other for approximately the last 30 years, and have worked closely together on a number of environmental and economic and political issues. I have great regard for his both academic and pragmatic judgments on these issues and am very pleased that Dr. Grove could be with us today.

I am certain that had I known the other two members of the panel as well as I have known John, I would have made an equally effusive but accurate and even restrained comment on them.

Dr. DeGrove.

STATEMENT OF JOHN DeGROVE, DIRECTOR, JOINT CENTER FOR ENVIRONMENTAL AND URBAN PROBLEMS, FLORIDA ATLANTIC UNIVERSITY

Mr. DeGrove. Thank you, Mr. Chairman, Senator.

It is a pleasure for me to offer a few remarks on this subject this morning, and certainly a challenge to stay within five minutes.

I would like first to commend the committee for addressing the issue of better research programs and new Federal, State and local partnerships to implement those programs and policies.

The emphasis on better coordination, including especially information sharing between and among State and local governments and the private sector is the correct focus. You have to start with the assumption that it is abnormal and not natural and very difficult for any governmental agencies at any level to cooperate with each other. I speak from first-hand experience in that matter at almost every level.

So you have to set up a system that has powerful incentives to bring that about before it is going to happen. There has to be, in my judgement, referring to an earlier question to Ms. Hanmer, a lead agency in matters of this kind.

I would have answered her question, I am sure modesty caused her not to answer this as specifically as she might have—I would have said the EPA was the answer to your question to be the lead agency in matters under discussion here, but that is my bias.

I would like to stress the importance, particularly, of the link between land use and the quality of coastal and marine waters. That link is the key to dealing with these issues.

Again echoing Ms. Hanmer's comment, it is the nonpoint source issues that we need to put our major focus on. They are tough technically and sensitive politically, but if you do not do it, you do not make it. If you do not believe that, just review the recent 20/20 report by Chesapeake Bay, the population growth and development of the Chesapeake Bay Watershed, looking at 10 years of effort to deal with the Chesapeake Bay problem. The conclusion is that it is a growth management land use problem, and if you do not get on top of that, you do not get on top of the water pollution problems that you have there.

I would like to also say that what we are looking for is comprehensive, integrated approaches to getting at these nonpoint source pollution, promoting compact urban development, using transferrable development rights and promoting on action agenda for States, the Federal Government and local government.

There are a lot of land use strategies and policies to bring this about that are being tried, many of them not being funded and supported adequately—and that is where I think we can come to some good that can be done by the legislation that you are proposing.

In Florida, we have used resource planning and management committees in a dozen areas as an integrated approach to getting Federal, State and local agencies and the private sector development groups and environmentalists together, crafting a management plan for a region that looks at the interface, among other things, between land use and the pollution in bays, estuaries areas and in the ocean.

So, those kinds of things—restore integrated systems, redevelop the coastal community—those can be done.

We have some models out there. Ms. Hanmer mentioned the estuarine system models. The habitat conservation plan, Senator, that you mentioned; SAMP, Special Area Management Plans the Corps uses; advanced identification efforts of EPA and the National Wetlands Forum Report calls for advance plannings as the key to protecting the nation's wetlands.

So, land use has got to move center stage, because that is the only way you can move to dealing with nonpoint source pollution. Now, how to do that, in the context of the legislation that is being proposed here?

Your proposed legislation could address more specifically the land use and water quality link. Land use policies need to be a larger part of both your research agenda in S. 587 and S. 588, and your action agenda in S. 1178 and S. 1179.

The Federal role here, it seems to me, would be to earmark more resources that you have already identified for these area-specific plan and implementation strategies, the comprehensive approach ensure the ability of the Federal agencies to participate in these things. I will just say that in one of these the East Everglades, Everglades National Park Resource Planning and Management Committee, when I was Secretary of the Department of Community Affairs in Florida, I found when we got all through that the regional representative from EPA had not come to the series of meetings over a year-long period to participate fully because the agent did not have any money in their travel budget to allow that level of participation.

I would have found some money in my travel budget if I had known that ahead of time, but I did not. And as a result, they did not buy into the plan that was worked out, and we had a lot of to-ing and fro-ing later.

None of these approaches, these comprehensive approaches, are being pursued as vigorously as they need to be, and a key component of this legislation would be to put some more incentives and some more requirements that we take this comprehensive and area-wide approach and see that resources are budgeted at the Federal level to participate fully, because the State and local governments also have to be the key to this.

Everybody has to get around the table and engage in tough negotiations to balance growth and development and the protection of natural systems—in this case, specifically ocean and coastal.

Thank you.

Senator **GRAHAM**. Thank you, Dr. DeGrove.

Dr. Boesch.

STATEMENT OF DONALD F. BOESCH, EXECUTIVE DIRECTOR, LOUISIANA UNIVERSITIES MARINE CONSORTIUM

Mr. **BOESCH**. Senator Graham, although I will briefly address the need for strengthening protection and restoration of marine and coastal waters, my comments will chiefly focus on research and monitoring.

Specifically, I will summarize the views of the marine research community on the proposed Marine Research and Marine Research Funding Acts, Senate bills 587 and 588. These are presented in more detail in my written testimony.

This statement was produced by a forum of representatives of seven major professional societies and national associations of marine researchers, including the Sea Grant Association, represented by Margaret Davidson here today.

Even though the trends in degradation of marine and coastal waters are alarming, it is also important for us to keep in mind and note that tighter environmental regulations during the 1970s and 1980s have in fact resulted in numerous improvements in coastal waters in some areas, particularly through point source control.

Nonetheless, the degradative trends elsewhere not only reveal the shortcomings of some of our management approaches, but also the lack of adequate knowledge about how coastal marine ecosystems work and are affected by human activities.

Clearly, improved management strategies, research and monitoring are called for. These improvements go hand in hand. With improved understanding provided by research, control strategies may become more effective. Well-designed monitoring serves as validation of the strategies and a barometer of trends and conditions, both natural and man-induced.

Several commonalities emerged from bills 1178, 1179 and related legislation offered in the House. These are one, requirements for marine water and sediment quality criteria and standards; two, more aggressive control of diffuse sources of pollution; and three, calls for more and more effective monitoring.

All require significantly extending our scientific understanding and its technical applications. The development of meaningful water and sediment criteria, for example, requires improved knowledge of the chemical fate, biological uptake, and sublethal effects of pollutants. You heard Dr. Engler talk about the technical difficulties which limit our abilities in the area of sediment quality criteria.

Although we have had some successes in the control of point sources of pollution, as I have said, evidence is building that large-scale environmental degradation frequently results from diffuse, non-point sources. Important diffuse sources not specifically addressed in these bills are those contributing to riverine inputs, in some cases introduced well out of the coastal zone.

The "dead zone" phenomenon in the Gulf of Mexico referred to in the letter of invitation, and upon which I have focused some of my personal research, may be an example of the large scale and dramatic effects of the tremendous overenrichment of our Nation's rivers and coastal waters.

Similar phenomena have now been observed in coastal waters of Northern Europe, the Adriatic and Black Seas during the 1970s and 1980s.

With regard to marine environmental monitoring, I should note that I am chairing a National Research Council committee on this very subject. Although our report is not yet complete, and I hope to have the opportunity to return to the committee and share with it our conclusions, it is my opinion that more effective regional scale monitoring of environmental trends is particularly needed.

Furthermore, much monitoring in the past has not been carefully integrated in management systems and designed to answer specific management questions. The development of monitoring protocols, if not inappropriately rigid, and requirements for national assessment strategies such as indicated in S. 1179, should help in this regard.

Monitoring, however, should be coupled with research. Otherwise, because of the interaction of natural and human-induced processes, inappropriate conclusions can sometimes be reached based upon monitoring observations alone.

Now, let me turn specifically to the Marine Research Act. The principal points raised by our Marine Research Forum in reviewing this legislation are as follows.

One, the focus of the bill, on research at a regional level, fills a critical need. Many emerging problems, for example involving atmospheric and riverine inputs, and the effects of global environmental change on our coastal environments, do not know geopolitical boundaries.

In addition, there is wisdom in approaching research and management questions in similar environments within biogeographic regions based on common models which allow the transfer of information and understanding from one part of the region to another. In this regard, Senator Graham, your comments about trying to find new mechanisms to deal with these regional scale problems are, we think, quite appropriate.

Secondly, we believe that the scientific community supports this initiative for regional marine research, provided it does not diminish the limited resources presently available for worthy Federal research programs. In this regard, this legislation would provide financial support for research programs from pertinent resources outside of the general treasury and builds on resources including the National Sea Grant College Program and active research institutions.

Third, we share with our colleagues in the Sea Grant Association the feeling that the Great Lakes should be included under this legislation.

Fourth, because of the different objectives and design criteria, time scales and research and monitoring, we would suggest that this Act explicitly focus on regional marine research, and that monitoring be more effectively implemented through amendments to the Federal Water Pollution Control Act.

Fifth, we recommend against the prior designation of institutions eligible to participate, which might preclude some very innovative research carried out at smaller institutions.

Sixth, the major concern of the research community with the current legislation is the layers of additional bureaucracy it potentially puts between the research community and the support for regionally directed marine research. Consistent with the execution of regional marine research planning coordination, we share your concern that it be action-oriented, Senator. While ensuring the relevance of research and strong peer review, the provision of financial support for research should be streamlined to minimize the administrative overhead. In our statement, we include some specific suggestions about how to accomplish this.

Finally, all research supported under the Act, we feel, should be judged technically sound by objective merit review by scientific peers.

Senator, thank you for the opportunity to comment.

Senator GRAHAM. Thank you very much, Doctor.

Ms. Davidson.

STATEMENT OF MARGARET A. DAVIDSON, EXECUTIVE DIRECTOR, SOUTH CAROLINA SEA GRANT CONSORTIUM; PRESIDENT, SEA GRANT ASSOCIATION

Ms. DAVIDSON. Thank you, Senator Graham, for allowing me the opportunity to provide testimony on this important and timely issue.

I am Margaret Davidson, and not only am I the head of the South Carolina Sea Grant Consortium, I am also the current president of the Sea Grant Association.

The association is comprised of colleges and universities and private industry groups that are dedicated to the issues that we are discussing today, the Nation's capability to enhance and protect as well as to use our coastal and ocean resources.

Sea Grant has evolved over the last 15 to 20 years to become the Nation's leading coastal ocean program, and as such, we connect the academic community represented by colleges and universities with State and Federal agencies and the private and public sector groups that are very interested in these subjects that you raise.

We do this through an active and coordinated program of research, education, and extension activities. As you well know, coastal pressures are increasing, and our Nation's water quality is declining. Despite the past two decades of trying to couple science with regulation, we nonetheless find ourselves at a point where we do have to develop innovative strategies to provide us with a better understanding of ecosystem-wide processes, man-induced changes, and the responses and the ways in which we can deal with those issues.

We also need to take heed and expand and improve the pool of scientific and engineering talent that is necessary to identify and solve these problems, and we most particularly need to step up technology transfer. That is one area in which Sea Grant has worked, and certainly the Florida experience has demonstrated to us that each of those elements is very critical in trying to deal with complex coastal issues. As you well know, when you were Governor, you had to deal with all those factors.

We applaud the members of this Committee for their efforts to address these critical needs, and we believe that we do need better regional planning, coordination, and research. We need better data collection and usage through comprehensive programs, and we certainly need to provide more comprehensive approaches to water quality control and broader programs that provide information to the real folks who can use those discussions.

As Dr. Boesch mentioned, we have been meeting with various members of scientific societies and organizations to discuss S. 587 and S. 588. Because of his testimony, I will not repeat those discussions.

But I would like to mention three concerns that we discussed in the context of coming up with that unified statement. And those, specifically, were issues related to the limited amount of moneys available to support these critical needs, the likelihood of sustained attention to the needs and a lack of leadership in some quarters on these subjects, and the lack of carefully coordinated and synoptic efforts among relevant Federal agencies.

In addition to the bills that we are considering today, I also think that we should consider Senator Burdick's bill, S. 1076, the Environmental Education Bill. I do not think that you can begin to address these comprehensive needs without also folding in his bill.

We particularly urge that S. 587 do include the Great Lakes. The successful inception of a regional program requires the benefit of the universities that exist in the Great Lakes. Among the scientific community, the Great Lakes have long represented an ecosystem in which we can test out theories about how coastal processes work. So we urge their inclusion.

We also urge a closer and actual coordination between EPA, NOAA and other relevant agencies, and that is a matter which requires more than the negotiation and conclusion of memoranda of understanding. It requires actual cooperation. It requires commitment from the leadership, and it requires a dedication at all levels of those agencies, down to and including the regional and State partners.

We are heartened by the new and innovative funding sources found in both S. 588 and S. 1178. Our experience with several Federal agencies has shown that new initiatives and new programs can be a death knell for an agency that begins to starve its existing programs in order to provide resources to that new effort.

For example, NOAA has a new and improved Coastal Ocean Initiative, but due to a lack of funds over the last year or so, they have not been able to divert sufficient attention to those issues. And that is not NOAA's problem alone.

In EPA's recent report from its science advisory board, it was reported that the agency had been driven by short-term approaches and short-term funding needs, and urged that EPA get more involved in education and technology transfer.

Contrast that with the National Science Foundation, which has a growing budget, and as a result of their growing budget is now also interested in coastal ocean issues as well.

I wish to echo Dr. DeGrove's comments about coupling land use with water quality issues. There can be no progress on either front until you do so. And I also wish to echo Dr. Boesch's comments about how these important matters—be they research, be they monitoring, be they whatever—they must extend beyond our geopolitical boundaries.

The bills considered by the committee are ambitious and far-reaching. They literally cover the waterfront.

We, the Sea Grant Association, would like to work with you to develop these legislative and agency initiatives. We have the scientific talent through our National Research Network; we have a proven track record in coastal research, education, and technology transfer, and we have also thought about this at length.

We have put forward a Coastal Change Initiative which starts out with a carefully focused initiative for improving water quality through innovative research and training efforts, complete with education and technology transfer.

Finally, we look forward to working with you to focus and strengthen efforts to enhance and protect our vital coastal ocean.

Thank you, Senator.

Senator **GRAHAM**. Thank you very much.

I would like to ask of each of you the question that I asked to the representative of EPA, and that is, using as much quantification and performance-based orientation as possible, what would you set as our standard for the year 2000, in terms of coastal protection?

Mr. **DEGROVE**. I will answer that probably not to your satisfaction, Senator, because I will not come up with very much in the way of specific criteria.

But I should think our goal for the year 2000 should be to have in place institutional arrangements, which we do not have in place now, which allow an integrated and comprehensive approach to protecting coastal and marine waters, by having a clear link between land uses and water quality.

Within that framework, then, you can develop performance standards, for instance, that have to do with the quality and character of the runoff from farming operations, the kind of thing we are now finally, belatedly doing with regard to sugar cane and dairy operations in Lake Okeechobee.

These are performance standards that are quantitative and that you have got to either adhere to or shut down the dairy farm or close down the sugar operation. And those kinds of performance standards are being experimented with in the Chesapeake Bay program, in Maryland, and now especially in Virginia in their Chesapeake Bay Protection Act of 1988.

That is the context in which I think some specific performance standards can be worked out, and should be.

Oregon, a State much heralded in its environmental approach and for protecting its resource values, has a long way to go in that respect in forestry practices, for instance. Runoff from careless and inappropriate forestry practices that cut right down to stream beds, let pollutants get into the water that runs into the estuaries—a very serious problem there and in the State of Washington, as well as in some other States. I do not mean to pick on them—but quantitative criteria, performance standards with regard to that kind of thing are needed indeed.

But the problem with performance standards, Senator, is that it takes a fairly sophisticated staff, planning staff and monitoring and implementing staff, to really develop and implement performance standards. And so, some resources have to go into the implementation strategies.

Mr. **Boesch**. Senator, I am sure you realize this is a difficult question, and I cannot give you a specific answer.

But let me give you some observations of where we have been with respect to trying to move towards that end, and where we might want to move.

One of the problems is that our environmental protection approach to the coastal ocean has been largely oriented towards the regulatory regime, where we spend a tremendous amount of our resources dealing with what comes out of the end of a pipe, or at an ocean dumping site.

Those activities are relatively poorly coupled with what the public is really concerned about—that is, whether the waters are safe to swim in, and if you can eat the fish, and if it is a viable environment.

We have had difficulties—it is not an easy problem to overcome—with merging those two goals. As a consequence, it seems to me, we have spent sufficient efforts in developing the broader goal of what we want the environment to be like, because we have had to focus on these isolated regulatory requirements.

We have some programs going on that have some hope for bringing us to that broader vision. Ms. Hanmer mentioned several of them, for example the National Estuary Program, the Gulf of Mexico Program in our region, which actively involves the States and the Federal Government in goalsetting.

I should tell you, though, that these programs—despite what my friends from EPA will say—should not be declared fully successful yet. We are still learning from them.

The Gulf of Mexico Program, for example, has just barely gotten off the ground with really a trivial amount of funding and is, at this point, really just cheerleading. But it is in those types of efforts where we try to put together our broader viewpoints of what we would like, say, the Gulf of Mexico to be. The Chesapeake Bay Program represents our most extensive effort in establishing these environment goals.

We can then work back from the goals in terms of what the inputs are and how we can control them. That provides us the strategy to reach that goal setting that you desire.

Senator **Graham**. Ms. Davidson.

Ms. **Davidson**. I certainly have an advantage in being fifth on the response list to this question, and I can agree with the comments that everybody preceding me has made.

More specifically, you have section 13 in S. 1179 which speaks about coordination and cooperation among agencies in setting relative roles.

I would suggest that you also add a section in there to require a forum on performance-based standards. Take the model from the National Wetlands Forum, and try to bring folks together.

This is not an issue that you want either a regulator or an academician to answer. This is something that you want people from a wide variety of interests and backgrounds to come together to agree upon, because the issue of performance based standards—I do not think it can be legislated nationally, either.

I think it does have some geopolitical constraints. Witness your performance based standards in Appalachicola Bay. They may be substantially different from performance-based standards in Tampa Bay, because of the different kinds of issues that you have, and the different types of interests that are involved.

I think our experience, since Dr. DeGrove mentioned it, with the best management practices and the forestry industry is a good example, because they try to get very specific about performance based standards, and those standards have varied from region to region, and certainly implementation and adoption of those standards have varied from region to region.

So, the final thing that I would like to point out is that acting as a national body, I do not think we can overlook the fact that all these issues come back to waste generation issues, both at home and at work. I think that you are going to have to address the issue of garbage—not only garbage at the end of the pipe, and garbage in the landfill, but garbage down the kitchen sink as well. And that is a very complex subject.

Senator GRAHAM. Dr. Boesch, you talked some about the necessary linkage between research and the policy questions to which that research would be applied.

I have had some experiences in my past where considerable amount of data has been collected, but when you start to ask the questions that were relevant to dealing with a particular problem, there was a passing in the night of the information that was available and the questions that needed to be asked.

Given the importance and the sense of urgency of this question, do you have any thoughts as to how this legislation we could attempt to mitigate that mismatch—that is, to have as much confidence as possible without inhibiting the intellectual inquiry which is critical to effective research that we would be doing research that would be building towards our capacity to make better policy decisions?

Mr. BOESCH. Yes, Senator.

The bills introduced by Senator Mitchell on marine research do essentially establish several regional bodies that would be charged with developing the goals and objectives of the research program. And this would be the viable mechanism to do what you ask.

It is not an easy task to do, because we have some cultural differences in terms of how the scientific community views the issues, and how the management community views the issues.

From the scientific community perspective, the managers often seem to be oriented to tasks which are short-term and doable, but which, however, do not attract the best and the brightest researchers; do not really help to advance our understanding in a fundamental way.

From the management standpoint, I am sure that we in the research community are viewed as—and we are, in many cases—those who just want to do their own thing and be supported to do that.

I think that by putting our heads together and developing scientifically challenging, innovative goals that also address the management concerns well up front, we can make some real advances in bringing the application of innovative science to this critical national problem.

Senator **Graham**. Ms. Davidson, I was impressed with your suggestion that we might add to this legislation at an early stage a consensus building process, to try to arrive at what those performance expectations were going to be.

Assuming that that were to be the case, how do you see that setting of ultimate performance based goals then filtering back into the establishment of the specific research agenda that Dr. Boesch has just outlined?

Ms. **Davidson**. Well, the scientific community demonstrates some profound cause and effect relationships, that is, where there is interest and where there is funding for both short-term as well as long-term basic research so there is scientific interest.

I think that coming up with more specific information to help understand and implement broad recommendations for performance based standards would come along quite shortly.

Senator **Graham**. Let me conclude with one final area, and that is the issue of land use and its relationship.

Land use has traditionally been a local and State responsibility. Given that history, what do you think the Federal role should be in the issue of land use policies as they impact on the coastal environment?

Ms. Davidson.

Ms. **Davidson**. Well, as you know, there have been some efforts to deal with coastal land use issues that have not been 100 percent successful.

I think that those programs need to be tied in with the objectives that you are trying to achieve. I think that greater emphasis needs to be placed on those issues, not only at the Federal and State and local level.

Coming from the Southeast as I do, I recognize that in order to actually achieve the kinds of goals that you are aiming for, you really do have to focus at the State and specifically at the local level, and I think that you have to do that through setting some goals. I think you have to do that through making funds available in this day and era to State and local governments, providing them the resources that Dr. DeGrove mentioned that they are always so short on.

And I think that you have to say to the Federal agencies, you will cooperate. I made a statement about requiring cooperation down to and including State and local partners. Every Federal agency has its preferred State vehicle. I think that you have to mandate that those agencies work together, as well.

Senator **Graham**. Dr. DeGrove.

Mr. **DeGrove**. I think the good news out there is that a number of States are entering the planning and growth management field in a comprehensive fashion, led by a group of States in New England—Maine among them—Florida, Georgia now, just last year, Washington State considering legislation now to put in place a set of planning and growth management goals, policies and implementing mechanisms, that allow the State and local governments to get their act together.

This includes mandating local governments to develop plans that are consistent with State goals and standards, and if you can get to that point in this land use area, you have abandoned the old notion of planning in isolation by each individual local government, and you can get your land use strategies together, and that is proving to be a crucial positive force in trying to carry out protection of estuarine and coastal areas, as well as other inland or freshwater wetlands.

But I think the critical thing here is to have the Federal Government build on what I think has been in many ways a successful model in the Coastal Zone Management Program. Some of the recommendations of the National Wetlands Forum follow along that same approach: incentives, funding, some kind of a requirement that if you do so-and-so, you will be rewarded with these kinds of fiscal supports in both planning and plan implementation.

I think that we have gotten more milage out of the Federal Coastal Zone Program than any program that I know of, and I think it can still continue to do good things.

Similar things, built more overtly and directly into this proposed legislation, in my judgement would be quite helpful in the full implementation of the National Wetlands Forum recommendations, so that States are encouraged to get their acts together.

They are moving in that direction anyway. It is amazing, how many local governments are willing to give up the old planning in isolation notion with regard to land use and get their act together with their neighbors.

That is a breakthrough of huge proportions, and that offers some hope for the future, I think.

Mr. **Boesch**. I bow to my experts colleagues on thiss subject, and I do not have anything to add to their excellent remarks.

Senator **Graham**. Very good.

Your capacity to defer to other experts is a very strong testimony to your own expertise.

Thank you very much.

The next panel represents Marine Interest Groups.

The Honorable John Bullard, representing the National League of Cities.

Mr. John J. Terpstra, director Port of Tacoma, Washington, and vice chairman of the American Association of Port Authorities.

Mr. John Lampe, Superintendent of Water Quality for the municipality of metropolitan Seattle. He is representing the Association of Metropolitan Sewerage Agencies.

Mayor Bullard.

STATEMENT OF HON. JOHN BULLARD, MAYOR, NEW BEDFORD, MA, REPRESENTING THE NATIONAL LEAGUE OF CITIES

Mr. **Bullard**. Thank you very much, Senator.

I suppose with so many Johns at the table, we have to be talking about sewage.

I am John Bullard. I am the mayor of the all-American city of New Bedford, and I am here representing not only New Bedford, but the 16,000 cities and towns that are members of the National League of Cities, and the 1,200 cities with combined sewer overflow problems.

I have an amended formal statement which I would like to be able to submit, and then I will summarize my remarks.

Senator **Graham**. Without objection.

Mr. **Bullard**. I am here to advocate a partnership between all three levels of government—Federal, State and local—to solve this national CSO problem.

The CSO issue is very difficult for a number of reasons. One is, they are hard to see. They are underground. People do not know what they are, and cannot understand what CSOs do.

It is an old issue. It was supposed to be solved by 1972, and there is very little understanding from people in Washington, or willingness to support an issue that is as old as that.

Finally, it is enormously expensive. It is estimated that the cost of solving the CSO problem for the 1,200 cities in the United States might be somewhere between $50 billion and $100 billion.

I find that there are two approaches that governments take towards solving environmental problems, and they are either punishment or partnership, and they are necessarily somewhat contradictory.

Punishment has as its goal the prevention of pollution by treating and penalizing people who are polluters. The laws and the mandates that the Federal Government sets up are an incentive for people not to pollute, and the mandates currently on the books are forcing localities to spend $62 billion in this effort.

Punishment or enforcement is in one way of thinking a very cheap way to be an environmentalist. The other way to clean our environment is through partnership, to actually correct problems. There state and Federal governments can work with localities to set priorities. They can put the focus on correction of problems, and to be a partner, one has to recognize the costs and abilities to pay of each of the other partners.

A partnership has the advantage of distributing costs broadly, and it requires a flexibility in designing technology based approaches for different cities.

The Federal Government must be able to walk this fine line between punishment and partnership. I am going to give you a perspective as Mayor, because that is my role, and talk a little bit about the problem that we have in the city of New Bedford, which may be greater than many other cities, but I think it has many common elements.

I do care about the environment, but in my role, caring is simply not enough. It is my responsibility as Mayor to comply with laws and to achieve results.

I work in the real world, and there is not a lot of room or time for theorizing. From my vantage point, what I see is an impending collision between an irresistible force and an immovable object.

The irresistible force is the people's desire for a clean environment, which has now found itself in the laws of our land, and it is a very good irresistible force.

The immovable object is, unfortunately, the fact that you cannot correct CSOs, you cannot build secondary treatment plants with a thousand points of light. They cost real dollars, and without real dollars, they do not get built. That is the immovable object.

Our job at the local and the State and the Federal level, in my opinion, is to see that this collision is avoided, because I think if we fail in that regard, the explosion that results from that collision will consume many of our Nation's cities, and I think that it will also ultimately consume our environment.

Something has to give, while we look at this irresistible force meeting this immovable object. What can give? The laws or the standards could give, but I think that would be a setback that no one would want to see.

Time—that is, how much time do we give ourselves to meet these standards—could give. There are negatives toward that approach, but that may be necessary in some cases.

The final thing that might give is money, and I advocate, of course, that that be something that is given by all parties—local, State and Federal.

In New Bedford, a city of 100,000, a seaport, we have 38 CSOs that discharge about 1.5 billion gallons annually. Our cost to correct our clean water problems are summarized as follow:

CSOs, $250 million.
Secondary treatment plant, $200 million.
Sludge facilities, $50 million.
Outfall, $20 million.
Two interceptors, $40 million.

That totals $560 million. That is what we are obligated to come up with in something that I call a partnership agreement but the lawyers call a consent decree that our city has with the State and Federal Governments.

That $560 million is an enormous amount of money. It happens to be the cost of one Stealth bomber. It does not buy much in the Defense Department, but it would solve all of our problems.

It is clearly without help beyond our citizens' ability to pay. With 100,000 people, that means $5,600 per capita is our environmental challenge.

To put that $560 million in some local perspective, our total budget is $116 million per year. The largest thing we have ever built in New Bedford, a hurricane dike that the Corps of Engineers built, was $25 million.

Our total bonded indebtedness is $22 million, and we are required to spend $560 million in our city. We are doing everything we can to do that.

We are raising our sewer fees and water fees and other fees. We are investing $10.6 million out of our budget of $122 million last year for clean water. We are prepared to play our part in this partnership.

The State, or in our case, the Commonwealth of Massachusetts, is also playing its part. Many people are aware of the financial difficulties that the Commonwealth of Massachusetts faces. It is also dealing with a deficit left over from last year.

But today, this morning, as we speak, Governor Dukakis is signing a bill of $1.5 billion to help the communities of Massachusetts meet their obligations for clean water. That is $1.5 billion.

They are doing that in difficult financial times because they know a clean environment demands action. And they are willing to put their money where their priorities are.

The Federal Government gives a contrasting view on the environment, because the Federal Government, unlike the people of the United States at large and local and State governments, seems to be backing away from a clean environment, at least as the allocation of resources is concerned.

Since 1984, the Federal Government has authorized $1.2 billion toward clean water, but less than $100 million has been spent. My central point in this presentation is that partnership is the way to correct problems.

You cannot enforce correction. You really have to, through a partnership, cooperatively pay for it.

All three levels of government have to realize that a clean environment is going to cost us more money, and I think poll after poll has shown that the citizens are willing to pay more money for a clean environment.

But while States and localities have shown that they are willing to make this investment, right now the Federal Government has not. And I think that that clearly has to change. Otherwise, the momentum that we have all worked so hard to build is going to be lost.

Once we lose that momentum, time will be wasted. Time has never been an ally of a clean environment. So, through this committee, I urge that focus continue to be placed on the environment, and that as you set your priorities, you realize that all of this costs money, and there is a role for you there, as well.

Thank you.

Senator **Graham**. Thank you, Mr. Mayor.

Mr. John Terpstra.

STATEMENT OF JOHN TERPSTRA, EXECUTIVE DIRECTOR, PORT OF TACOMA, WA, VICE CHAIRMAN, AMERICAN ASSOCIATION OF PORT AUTHORITIES, ACCOMPANIED BY JOSEPH BIRGELES, SUPERVISOR OF HARBOR PLANNING, PORT AUTHORITY OF NEW YORK

Mr. **Terpstra**. Senator Graham, I am the executive director of the Port of Tacoma, a public port in the State of Washington, and the Vice Chairman of the American Association of Port Authorities.

With me today—and I would like to introduce him—is Mr. Joseph Birgeles, who is the Supervisor of Harbor Planning at the Port Authority of New York and New Jersey, and he will be available for any questions you might have on that specific area. He is also AAPA's Dredging Subcommittee chairman, and very knowledgeable on this subject.

AAPA commends you for your commitment to reducing pollution and to restoring the health of our coastal environment. Much remains to be done, of course.

The pollutants still entering our waterways adhere to sediments which eventually find their way into our harbors. Because of the need for navigation, public port authorities and the Federal Government must relocate the contaminated residues, often at tremendous expense.

Clearly, seaports will be one of the many beneficiaries of a cleaner marine environment.

While we support your primary objectives—that is, to reduce the sources of pollution into our coastal waters—the legislation we are considering today threatens to jeopardize the progress we have made with respect to the management of dredged materials, the very thing that now is a primary focus of these bills.

First of all, we agree that more nationwide regulatory consistency is needed. Enormous resources are expended by ports and the Government to characterize the soils and to develop environmentally sound disposal solutions which satisfy all the various Federal, State, and local regulatory agencies.

AAPA is counting on the ongoing EPA regulatory revisions which should be put into use formally this fall to promote the needed consistency, and to reduce uncertainty for our industry.

However, in contrast to our steady progress, and increasingly sophisticated handling of dredge material, S. 1178 would increase inconsistencies and possibly increase the cost of port operations without commensurate benefits to the environment.

In addition, it would likely have dramatic cost implications for Federal maintenance dredging programs, as well as putting some ports at a competitive disadvantage and contributing to our Nation's difficulty in competing in world markets.

The fundamental issue of concern in both S. 1178 and S. 1179 is how numerical sediment criteria are put to use. We agree that criteria may be put to good use in site monitoring, research, and for ecological assessment purposes as suggested in S. 1179.

But to use them in actually managing dredge material is troublesome. S. 1178 would employ numerical criteria in the regulatory process, preempting the ongoing regulatory revisions and overturning longstanding management protocols.

EPA's Science Advisory Board, the National Academy of Sciences, as well as international experts at the London Dumping Convention have all expressed serious reservations about the numerical sediment criteria systems that have been proposed to date.

These reservations exist because of the inherent difficulty in assessing biological impacts in the marine environment from chemical data alone. Because of soil binding properties, potential toxicants are quite often chemically and physically bonded to the soil, rendering them unavailable to marine organisms.

In widely varying marine environments, the only scientifically justified way to determine whether the sediments are toxic is to undertake biological or "effects-based" tests on the soils in question.

Numerical sediment criteria risk oversimplification of very complex relationships. Moreover, reliance on an arbitrary standard to determine whether sediments are clean could lead to decisions which are less protective of the environment than under the current effects-based system.

Furthermore, numerical sediment criteria can distort the analysis used to select the disposal site. Preferably, both land-based and water-based disposal alternatives are considered on an equal basis.

Some State regulatory agencies want to use a simple numerical system to eliminate one disposal option, without regard to the environmental impacts of the alternatives.

Clearly, the Federal Government's overall management of the dredging program—both the Corps and the EPA's—can be improved. For example, resources are currently lacking for long-term dredge material disposal planning, for disposal site designation and for disposal site monitoring.

AAPA welcomes the opportunity to work with you in these and other areas to improve the program.

In conclusion, AAPA members have a large stake in your efforts to end both point and nonpoint source pollution of our waterways. In our opinion, this is where scarce taxpayer dollars should be spent. With much-needed long-term planning and consistent application of the environmental safeguards currently being utilized and refined, the detrimental impacts of all types of dredge material relocation can be rendered negligible.

I would be happy to answer any questions you might have. Thank you, Senator.

Senator **Graham**. Thank you very much, sir.

Mr. John Lampe.

STATEMENT OF JOHN LAMPE, SUPERINTENDENT OF WATER QUALITY, MUNICIPALITY OF METROPOLITAN SEATTLE, REPRESENTING THE ASSOCIATION OF METROPOLITAN SEWERAGE AGENCIES

Mr. **Lampe**. Senator Graham, thank you.

I am John Lampe, Superintendent of Water Quality for the Municipality of Metropolitan Seattle.

Seattle Metro is a member of the Association of Metropolitan Sewage Agencies. AMSA is a national organization of more than 100 such agencies serving nearly 90 million citizens across the country.

Our organization and its membership has been expanding its perspectives, particularly over recent years, to encompass the broader aspects of protecting the receiving waters to which we discharge.

As such, Senator, I want you to understand that we are a capable and an energetic resource to assist you in looking at the larger issues that this legislation intends to deal with.

I will summarize my written comments by focusing on three specific areas, first dealing with some specific issues in the legislation that give us some pause for concern.

Secondly, I will speak a little bit to our proposed approach to the best way to deal with the issues in the legislation, and thirdly, of course, to speak to the resource issues attendant to the needs.

First, with respect to some specific concerns, water quality standards have been spoken to by many of the panelists this morning. Our concern here is that the water quality standard-setting process not be left solely to the Federal Government, but that local and State agencies also be involved.

If we are to develop a sophisticated and an aggressive implementation of those standards, it must involve local site-specific interests in order to engender the local support that will be required to mount the programs to achieve those standards.

Secondly, and specifically with respect to CSO, the State of Washington has developed a CSO control regulation, which does not focus so much upon the zero discharge from CSOs, but rather relates to ensuring that we eliminate the environmental impacts from CSOs to the beneficial resources of the receiving waters.

We look specifically at the possibility of total elimination of CSOs in the Seattle metropolitan area. And our conclusion was that it would cost us at least three times the amount we are currently investing—some $200 million—to achieve a zero discharge with relatively little increased environmental benefit for actually eliminating the total flow.

Rather, we are focusing on ensuring that we eliminate the direct environmental impacts to the beneficial resource.

Lastly, with respect to industrial pretreatment and continued focus on point sources, the EPA testimony indicated, and we would support, that we may be approaching, at least in many of our estuarine and marine resource areas, a level of diminishing returns in terms of increased focus on point source and industrial pretreatment programs.

We have done considerable research in the Puget Sound region, and support again those panelists that argue that the nonpoint source contributions and the land use aspects will be very important in the future.

With respect to the overall management approach, as has been stated by the Office of Technology Assessment and many of the panelists this morning mentioned it—we are now into an area where the environments are very site specific, and the problems in those environments are highly site specific.

We would propose to move forward aggressively within the concept of the management conferences, looking at the specific localized environments, developing a prioritized plan of action, dealing with the local site specific areas as opposed to a continuation of more prescriptive programs from the Federal level.

Lastly, with respect to the resource issues. We see a substantially unfinished agenda yet from the 1987 Act. Many of the requirements in the 1987 Act remain important to us, and we would hope that within the context of your further review of this legislation, you would take into consideration the yet-unfinished agenda from the 1987 Act and equate it to the additional requirements which are contemplated within these Acts.

It is our sense that additional requirements with near-term statutory deadlines would not allow us to adequately deal with the agenda which is already before us.

Thank you.

Senator GRAHAM. Thank you very much, sir.

I would like to start with the same question that I have asked of the two previous panels, and that is, in a performance-based, and to the extent possible, quantified measurement, what would you state to be our national goal in terms of coastal protection from now to the year 2000?

Mr. **Bullard**. My answer to that, Senator Graham, would be to respond with a question which is how much is the Federal Government willing to spend to achieve this standard? Because setting standards without allocating resources is useless, and can be destructive.

And I think that of the 1200 cities that have CSO problems, only 300 of those, or 320, have approved plans. And then I think one standard ought to be that all 1200 cities ought to have plans in place that specifically respond to their situations for correcting CSO problems in their localities, and I think that the standards set—I wholeheartedly agree with Mr. Lampe—ought to realize that different localities have different situations. Correcting a CSO problem in one place may be done one way, and in another place should be done another way.

I think that if the plans are in place for all 1200, so that the communities agree, the States agree and the Federal Government agrees that these plans make sense, each for its own locality, and if a total cost is then estimated for achieving that compliance with that plan, a cost in dollars as well as a cost in years, then I think you have the basis for a national standard.

I think then the Federal Government has a basis for saying, "What should our share be of this? Should our share be that we should make up 25 percent of the total cost, or 15 percent, or 50 percent?"

Whatever it is, I think there ought to be an assumption that if the Federal Government is going to work with local and State governments, it ought to be bringing something to the table

If the Federal Government says, "No, we want a place at the table without any money," I think that undermines the credibility of the Federal partner. I think it may also make it impossible, no matter what the laws say, for some of our communities—our poorer communities, especially—to achieve that standard.

So, I think a national standard is appropriate, but I think it has to be developed—in the case of CSOs—with each of those 1200 communities being treated as a separate community with a separate problem.

And the plan should be developed, the costs should be estimated, and then the relative shares that make some kind of sense on a fairness measurement should be addressed, and then I think you will have an answer as to what the standard ought to be, what the timetable, and what the cost ought to be.

Senator **Graham**. Thank you.

Mr. **Terpstra**. Senator Graham, if it were not for one very important thing that is missing, I believe that I would think in the year 2000, the objective which is stated in S. 1178, that is, an objective of a balanced indigenous population of shellfish and wildlife, and allowing for recreational activities in and on the water—I would think that that would be a very, very good objective for us to shoot for.

The missing element is the reasonableness and the balance between that and economic development. We in the port business, of course, are at the confluence of all of the outfalls and the drainages from the freeways and all the contamination ends up in our already industrialized, urbanized, fully developed estuaries.

This should not possibly, and probably cannot, meet that objective. Some resources should be saved for the most important areas.

The public port authorities are a unique mix of business and government. In our government role, we are the stewards of the land and the waterways and responsible to the public for maintaining a clean environment in their best interest, while assuming a significant economic responsibility for their well-being.

Now, we want a clean environment—clean to a level that is absolutely necessary. And of course I am sitting between two gentlemen here who sometimes pour their contamination into our ports, and require us to clean them up.

We need to stop pollution in our channels and berthing areas, because most of this results from discharges of others, both private and public, so that the ports are not inadvertently recipients of the cleanup burden.

Now, I would caution, though—and I agree with Mayor Bullard—clearly the investment of our national resources should be carefully balanced, reasonable, and clearly necessary.

We have worried that pushing our industrialized, urbanized port areas toward pristine standards will use up all of the resources without having resolved the most serious problems.

Senator GRAHAM. Mr. Lampe.

Mr. LAMPE. Senator, I suppose in dealing with one of the comments made by Mr. Terpstra that there are differences, even at the local level, as to who is the polluter and who should be responsible and to what degree for what cleanup.

And I suppose my sense is that if by the year 2000 we could have in each area, in each water body to be protected, a specific plan that really interprets the language that speaks to balanced indigenous populations, and describes what that ecosystem would look like when that had been achieved in that local environment, we would have the beginnings for the basis of making the types of tradeoffs which are suggested here by Mr. Terpstra.

In addition to that, we would need to have a prioritized list of actions that were agreed upon and primarily would be implemented at the local and the State level.

Thirdly, we need to have a monitoring program that would allow us to ensure that there was in fact progress being made to achieve that idealized description, and fourthly, and it is a point that has been made several times this morning, the management structure, in order to ensure that that process was continued over time—and that, in my view, means that we must have the land use agencies very much involved in that process and very prominent in that process.

Senator GRAHAM. Mr. Terpstra, you talked about the difference between the effect approach and a statistical approach relative to sediment measurement.

Could you give me either a real or hypothetical example of how those two different approaches might be applied to a particular circumstance?

Mr. **Terpstra**. Well, I believe the statistical approach, as you mentioned, Senator, is what we call the numerical approach that is created by statistical analysis.

In the case of the numerical approach, a threshold would be determined, and applied in a rather universal form, our understanding is. If this were exceeded, it would be determined to be contaminated enough such that the material could not be placed in one of the waters of significant interest.

We believe that there are far too many factors that go into the effects resulting from that created threshold to be able to have any given threshold apply broadly. I guess the example I can think of is, we have in the State of Washington in Puget Sound a standard for our deep water disposal now, that was created very similarly to a given standard, a numerical standard. That is, if you exceed a certain ppm parts per million of a certain chemical, it is understood that you cannot place that material in the deep water.

But it then triggers a biological effects test, if you choose, because the testing is very, very expensive. To go through that type of an analysis—to see if the numerical standard is valid, and if in fact it proves that it is not valid, then you can go ahead and dispose of the material. If it is valid, you now have a new problem of a more expensive disposal process.

I do not know if that is the answer.

Senator **Graham**. Each of you have touched upon the question of the Federal resources that would be available to accomplish the objectives sought.

I have been concerned that there is a tendency for the Federal Government to promise more than it has historically been able to deliver.

What effect, if you have had the same experience, has that overpromising had in terms of your planning and local efforts at achieving your water antipollution goals?

Mr. **Bullard**. That is a good and difficult question.

As I said before, I think that citizens understand that a clean environment costs more money. We have all disposed of our waste in very cheap ways, and we are now paying the penalty of it.

And if we can show a link between investment and a cleaner environment, and that increase is judged to be reasonable, whatever that is—affordable, that people are willing to pay that, I think that the Federal Government is continuing to go at 100 miles per hour in terms of what standard we want to achieve, and what expectations we have for our environment.

That serves a very useful purpose, because I think that people, more than ever today, are concerned about the decisions that we make and how they affect our environment.

But that is not being followed with appropriations or meaningful assistance to achieve those expectations, and I do not see us getting to a crash point immediately, but the crash point is going to be when people understand that we are not going to be able to reach those standards that everyone is leading us towards. We will not be able to afford it.

In New Bedford's case, we are under a consent decree to do this and this and this and this by 1995. And our consent decree says, as many do, you will do this regardless of what money you get. Whether or not you get any money, you are required to do this.

Well, EPA and State agencies, the Department of Justice, can put that into consent decrees, and a Mayor, if he has no other alternative, will sign it. But you cannot make somebody fly if you do not give them wings.

If we get to a point, in New Bedford or any other city, where people learn that they are not going to be able to achieve the results that everyone has been striving for, then I think we are going to lose a lot of ground very quickly, because cynicism will rapidly set in. And people may abandon as hopeless this goal of a clean environment.

That is why the measured setting of goals, the recognition of cost versus benefit, the recognition that a technology for one place may be appropriate and not appropriate for another, is very important, because it always allows us the checks and balances of saying, "What can we pay for?"

And so, overpromising—I do not think it has done irreversible damage now, but it is a very important concern that you raise.

Senator **Graham**. Any additional comments on that question?

Mr. **Terpstra**. I would like to mention just a couple of things.

I believe that where the dollars can be best spent, and hopefully the promise can be fulfilled, would first of all be with the system that is going on right now.

We at AAPA and my own port are very confident that the Corps of Engineers in close relationship that they have already with EPA is doing an excellent job. We believe that their funding is very important, though, to complete that job for us, such as more long-term planning, better training. We find that their people are very—they have large turnover. They need competitive salaries in high-cost cities.

There are Federal dollars that are needed to make the present system go. As a matter of fact, our feeling is that the system is working. Give us some years to make this really good cooperative effort, that has started to work to work better. If it is not broken, do not fix it.

I also would like to support my colleagues on the panel by saying that source control is going to be very important when it comes to dredge material, and we do not want to be flip by just saying others caused that.

Primarily, these are going to be public issues, right there in the Port of Tacoma, the City of Tacoma. They have the outfalls, and that city is going to be faced with things very similar to Mayor Bullard's city. And we certainly would support the help from the Federal Government as much as possible, because these are big dollars.

Mr. **Lampe**. The question, I think, is increasingly important with respect to our local situation. We are just now commencing on a $1.2 billion program for combined sewer overflow control and upgrades to our treatment plants and our treatment system capacities.

We are expecting somewhere in the neighborhood of 25 percent grants to that program through a combination of both Federal and State resources

We are expecting our rates to more than double between now and 1995.

The people of Puget Sound really consider the Sound as a treasured resource, and they have historically and they are now continuing to request that public agencies develop positive and aggressive programs to ensure the protection of that environment.

Yet, as our rate increases begin to occur, we are beginning to see more and more the critical question, are we doing this because it is required, or are we doing this because we know there is demonstrated return on the invested dollar?

So, particularly in our case, over the next seven year period of time, as we are raising our rates dramatically, that question will become more and more important to our ability to sustain the local generation of the resources required to do the job.

Even as we are undertaking this major capital program, we are able to raise our rates to do such things as source control and the nonpoint environment. We have undertaken major programs in household hazardous waste protection, for example, as a major way to eliminate toxics from getting into the receiving water environment.

So, there is a demonstrated commitment to deal with the issues at the local level, but only after there is a clear and cogent demonstration of the problem, and a satisfaction that there is a real return on the invested dollar at the local level.

Senator **Graham**. I want to thank the members of this panel. As with their predecessors, this has been an extremely constructive and informative hearing, and I appreciate your contribution to enhancing the legislation that is before us.

Before we adjourn, I would like to announce that the Water Pollution Control Federation has developed testimony. That testimony will be included as part of the record of today's hearing. (See page 435.)

If there is no further business to come before the combined subcommittees, the meeting is adjourned.

[Whereupon, at 11:35 a.m., the subcommittees were adjourned, to reconvene at the call of their respective Chairs.]

[Statements submitted for the record and responses to additional questions follow:]

STATEMENT OF
REBECCA HANMER
ACTING ASSISTANT ADMINISTRATOR FOR WATER
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEES ON ENVIRONMENTAL PROTECTION AND SUPERFUND, OCEANS AND WATER PROTECTION
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

JULY 25, 1989

Good morning. I am Rebecca Hanmer, Acting Assistant Administrator for the Office of Water, U.S. EPA. I am pleased to be here today to speak with you about the problems of coastal pollution. The challenge before us is to protect and restore the environmental quality of our near coastal waters, living resources, and their habitats. Solutions to these problems become complex as their major causes are land-based, and primarily due to the population growth and development occurring in our coastal zone.

Recognizing the environmental problems in our coastal waters, we have begun several major pollution prevention and control activities which I will briefly describe. Common to these activities is our view that, in addition to enforcement, the most effective and appropriate Federal role is one of leadership and facilitation. We are responsible for encouraging partnerships among Federal agencies, State and local governments, interest groups, and private citizens; and for encouraging our citizens to take action. We need to target ongoing base pollution control programs to address near coastal water problems, to develop and disseminate better scientific information and management tools needed to make and carry out good decisions in coastal areas (including integrating State and local land use management and water quality programs), and to help State and local governments develop and use a variety of funding mechanisms to finance needed measures. Also, we see the importance of building grass-roots understanding and support for protecting our coastal resources and of encouraging individuals to take responsibility for pollution and modifying their lifestyles. This "bottom up" process of collaborative problem-solving builds the political and public will to support and pay for environmental protection.

INTERIM NATIONAL COASTAL AND MARINE POLICY

One of our most recent activities is our Agency-wide internal interim National Coastal and Marine Policy which highlights the importance we are now giving to the coastal areas. The Policy was issued by former Administrator Thomas this past January and has been endorsed by Administrator Reilly. The Policy establishes goals and specific objectives which focus on recreational uses of our beaches and shoreline, pollution controls to ensure protection of living resources and their habitats, pollution prevention, land use and growth management in cooperation with CZM and local and State agencies, improved coastal science, and international efforts. In order to accomplish these goals, emphasis is placed on building partnerships among Federal agencies, State and local governments, interest groups and the public. An Agency Standing Committee is being formed to oversee implementation of the policy and to ensure that base programs are maintained before targeting Agency actions.

In addition, the Policy is providing the unifying framework for EPA's implementation of new coastal and marine legislation including the Ocean Dumping Ban Act of 1988, the Medical Waste Tracking Act, the Shore Protection Act, and the Plastic Pollution Research and Control Act of 1987 passed by the last Congress.

The Policy currently is being implemented through the Agency's geographically-focused programs, the Near Coastal Waters Program and National Estuary Program under the Clean Water Act and the Oceans Program under the Marine Protection, Research, and Sanctuaries Act and the Ocean Dumping Ban Act. These programs emphasize the importance of taking action now where specific problems are identified so as to achieve environmental results, even while we build scientific and management capability to tackle other issues.

NATIONAL ESTUARY PROGRAM

The National Estuary Program (NEP) was begun in 1985 by EPA and given a legislative basis of existence by the 1987 Water Quality Act. It is building Regional, State and local capability to address coastal problems and demonstrates various approaches that may be applied to estuaries and coastal water bodies nationwide. We feel it is time to apply the consensus building approaches developed in this Program, as well as other lessons learned, to our expanded Near Coastal Waters program. Presently, there are NEP Management Conferences in 12 areas and our FY 1990 budget request includes funding for four additional Conferences.

THE NEAR COASTAL WATERS PROGRAM

The Near Coastal Waters Program represents EPA's commitment to address broader coastal issues and to strengthen the use of our existing regulatory authorities. The Program builds on lessons learned in the NEP and other coastal programs, develops new management and technology transfer techniques, and provides for the flexibility needed to tailor protection and management efforts to the needs of other coastal waters.

Our implementation of the Program over the past two years has included pilot projects and efforts to stimulate the development of Regional Near Coastal Water Strategies. The pilot projects are joint EPA-State efforts that address environmental problems in selected near coastal waters. Their purpose is to demonstrate innovative management actions that can be applied in other areas of the country. The goals of Regional Strategies are to identify near coastal waters needing management attention and to develop and implement a management structure for protecting these waters. The strategies seek full integration of existing EPA, State, and local water quality programs identified by the Regions and the States. Regional strategies are being developed by Regions IV and VI under the Gulf of Mexico Program and by Region I in Boston cooperatively with Maine, Connecticut, Rhode Island, and Massachusetts. Similar efforts are now beginning in our Regions III, IX, and X. Regions II and V are expected to develop regional strategies which will include strategies for the Great Lakes as well as marine waters.

In addition to fostering EPA/state/local partnerships, the Regional Near Coastal Water Strategies are stimulating needed collaborative efforts among various Federal agencies involved in coastal activities. For example, the US Soil Conservation Service, NOAA and the US Army Corps of Engineers have assigned staff to work specifically with the Gulf of Mexico Program Office.

LEGISLATIVE CONSIDERATIONS

The legislation that has been introduced by Senators Mitchell and Lautenberg targets Federal and State actions in the coastal zone as well as providing for regional marine research programs. EPA has not yet had time to develop formal comments on these legislative proposals, and we are not able to address specifics of the proposals at this time. However, we would like to discuss, in a general manner, some principal issues which we feel are important factors in considering whether additional coastal protection legislation is necessary.

FLEXIBILITY

We have found that coastal problems are site-specific and a function of the physical, biological, and social conditions that exist within a given area. To use the old adage, we must be careful not to try to hammer a square peg into a round hole by dictating a solution which may not be appropriate in a given situation. Thus, the need exists to have the flexibility at the Federal, State, and local levels to tailor cost-effective solutions to the particular local problems.

The present water quality standards program, established by the Clean Water Act, is a prime example of a program that has been successful in controlling problems on a national scale through use of this flexibility. Under this approach, the Clean

Water Act correctly places responsibility on the States. EPA first developed the scientific and regulatory framework, including publishing water quality criteria documents for over 100 pollutants. States have responded by determining, and establishing through State-specific and waterbody-specific water quality standards, what uses - drinking water supply, protection of aquatic life, shellfish growing waters, or others - are appropriate, and should be maintained or recovered. The "designated uses" are protected by water quality criteria that are also adopted by the States.

FEDERAL, STATE AND LOCAL RESPONSIBILITIES

We feel that successful programs must recognize the appropriate role played by the Federal, State, and local governments. In our experience, the biggest successes in coastal protection are in those areas where the local community has identified with the need to protect a given resource, as evidenced by the large public support for the Chesapeake Bay and Puget Sound Programs. Some of the solutions to the coastal water problems, such as appropriate land use and management practices, are State and local responsibilities and we need to encourage States and localities to use these basic authorities effectively.

The strength of the National Estuary Program (NEP) is its "bottom up," consensus building approach. It is through this painstaking process that consensus necessary to commit resources and to implement solutions is generated. Primary responsibility for the conduct of the NEP lies with State and local governments. Therefore, local and State consensus and commitment are absolutely essential to the successful development and implementation of a conservation and management plan. Shifting the primary focus for conduct of the NEP to the Federal level could jeopardize local and State involvement and commitment and, we think, jeopardize effective long-term implementation.

BASE PROGRAMS

In our efforts to protect the near coastal waters, we need to build as much as possible on the existing base program framework and avoid competing or overlapping requirements which may divert precious resources and dilute the impact of any of our efforts. We have in place a process by which the Federal government makes available the scientific knowledge by which States determine their water quality standards, permits are issued and enforcement is taken when violations occur. We can be most effective by strengthening this process as needed and targeting its strengths.

POINT SOURCE POLLUTION

In this area, we need to consider carefully the most cost-effective, environmentally sound manner in which to address the special problems created by combined sewer overflow (CSO), stormwater, and ocean discharges. We are entering an arena of more complex problems and science, and potentially costly solutions. I would like to highlight a few main points.

CSO problems are well-documented in the coastal areas. EPA has issued an interim final CSO strategy which addresses many of the concerns that your legislation raises -- basically the need to identify and control through permits combined sewer overflows. We need to work together to develop the most environmentally sound and realistic approach to deal with this expensive problem.

In the stormwater area, EPA has proposed regulations which we feel begin to meet the need for addressing the requirements of the 1987 Water Quality Act and the environmental risk associated with stormwater discharges. The proposal seeks to achieve a balance between establishing an effective regulatory mechanism and minimizing the administrative burden associated with developing and processing permit applications for all of the large number of stormwater dischargers. The Clean Water Act also provides authority for EPA or States to require permitting of stormwater discharges that contribute to water quality standards violations or which contribute significantly to polluting the waters of the United States. We need to consider the extent to which these existing authorities may be effectively used to protect the coastal waters. I'm not sure anyone yet appreciates the magnitude, costliness, and complexity of the job yet ahead of us to deal with existing stormwater permitting authorities.

Ocean discharge criteria under Section 403(c) of the Clean Water Act have proved to be useful in restricting discharges into marine waters. However, we need to examine carefully whether and how the requirements of Section 403(c) would be beneficial if extended to coastal waters. An automatic extension of the 403(c) requirements to the larger population of dischargers into coastal waters may actually delay obtaining further controls on pollutants that are already being discharged. Our existing water quality-based permitting and pretreatment programs are being used to put in place more stringent controls on pollutants of concern, including bioaccumulative toxicants. In some cases, applying the ocean discharge criteria could result in more comprehensive controls, for example, in evaluations of dischargers discharging into a sensitive aquatic biological area. In other instances, the ocean discharge criteria could have a negative environmental result due to delays in water quality based permitting brought on by disagreements over the results of applying 403(c) criteria. Accordingly, we are working towards assessing when and where 403(c) criteria would be most effective. These recommendations are being assembled for a Report to Congress which we expect to complete by the end of the year.

NONPOINT SOURCE POLLUTION

Despite progress in addressing point source pollution, nonpoint source pollution makes water quality goals in many coastal areas difficult to attain. For example, between 1971 and 1985, 50 thousand acres of shellfish beds were upgraded in the Northeast and the Mid-Atlantic because of water quality improvements principally due to improved point source controls. However, during the same period there was a downgrade of almost twice that acreage due to coastal development and urban runoff.

Most States are making a genuine effort to comply with requirements of the Clean Water Act, but they lack scientific and technical expertise to implement and institutionalize nonpoint source pollution controls and to evaluate their effectiveness on water quality. States, with EPA's assistance, need to improve management of agriculture chemicals, devise controls for urban runoff, and, with local governments, institutionalize more environmentally sound land use management practices. These problems must be addressed in order to clean up and prevent contamination of coastal areas.

COASTAL WETLANDS AND OTHER SPECIAL AQUATIC AREAS

Any comprehensive approach to protecting our coastal areas must also consider what actions are needed to improve wetlands protection and management. The status of programs protecting and restoring wetlands and other special aquatic areas differs somewhat from EPA's base water programs in that all the basic authorities are not yet in place. There are significant gaps in protection, inefficiencies in existing programs, and public actions and incentives operating at cross purposes.

The President set a goal of no net loss of wetlands in his 1990 Budget statement, and established an interagency Task Force under the Domestic Policy Council to implement this goal. EPA other agencies will be participating on the Task Force. The Task Force is examining a number of federal programs and opportunities for improving protection of wetlands including identifying possible changes in regulatory programs to provide more comprehensive protection of wetlands and better efficiency in decisionmaking.

DREDGED MATERIAL

One of our goals in dealing with dredged material is to attempt to treat disposal under section 404 of the Clean Water Act and under the Ocean Dumping Act in as consistent a manner as possible unless there are strong technical or statutory reasons for the inconsistent treatment. We are concerned about any legislation that would create separate regimes for the treatment of contaminated dredged material depending on whether the disposal is inside or outside of the normal high tide mark. We believe that if statutory changes are to be made in the area of contaminated dredged material, they should result in consistent treatment of dredged material between the Clean Water Act and the Ocean Dumping Act to the maximum extent possible.

MARINE RESEARCH

We share your concerns over the state of our estuarine and near coastal waters and believe that well-focused and carefully planned marine research and monitoring play an important role in developing effective measures to protect and maintain the quality of our coastal waters. One of the Agency's highest priorities is to add a new focus on coastal science. EPA's National Coastal and Marine Policy establishes the goal to achieve greater understanding of the effects of pollution on complex coastal and marine ecosystems by expanding scientific research and monitoring programs, and the development of new technology. EPA has intensified efforts at its research laboratories to provide practical research products to help coastal managers solve problems and is developing monitoring methods to characterize the status of near coastal water ecosystems and to measure the success of management actions. In coordination with NOAA, we are conducting research to provide, on a national scale, information on the condition of coastal ecosystems to formulate, implement, and evaluate risk management strategies at national and regional levels.

However, as we testified before this Committee last year, we continue to have concerns about the establishment of regional marine research centers. First, the regional research programs would duplicate existing Federal and State programs and could divert resources to administrative costs and overhead. I believe that, at present, technical capabilities and programs exist at the Federal, State, and local level for conducting coordinated, region-specific marine research and monitoring activities. Second, research programs must be held accountable to answering priority management questions, particularly linking the pollutants to the their source. Evaluation of how research proposals answer those questions must be an integral part of a comprehensive research program to ensure that results will be of actual benefit to the coastal and marine environment.

RESOURCES/IMPLEMENTATION

While we can see where we need to be going, cleaning up our near coastal waters and protecting our coastal resources will not be an easy task nor will it be inexpensive. The relative roles of Federal, State, and local governments as well as private industry must be assessed carefully. The States in particular are facing major new responsibilities. For example, as I testified before this Committee last month, the phase out of the Federal construction grants program and transfer to a new State

Revolving Loan Fund program will provide a long term approach to meeting wastewater construction needs. However, a by-product of this change -- namely the disappearance of the set-asides associated with the Construction Grants Program -- will require States to identify additional funding resources for their overall water quality programs.

We are just finishing a State Funding Study that has quantified the State resource problem and analyzed possible solutions, such as revenue from fees, fines, and penalties, and other sources. Similarly, we believe that Federal and State resources, the costs of implementation, and the variety of potential funding sources and approaches must be evaluated carefully when developing coastal or any environmental legislation. We believe that the potential exists for a variety of funding mechanisms to support environmental legislation. However, these mechanisms must be carefully examined to ensure that they complement our goals and provide for the most effective use of generated revenues.

CLOSING STATEMENT

In summary, our goals are the same: to preserve and protect the environmental quality of our near coastal waters and habitats. We will continue to evaluate the specific proposals in your legislation and look forward to working with you and your staff.

This concludes my statement. Thank you for the opportunity to appear before you today. I would be pleased to answer any questions that the Subcommittee may have.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 26 1989

OFFICE OF CONGRESSIONAL
AND LEGISLATIVE AFFAIRS

Honorable Max Baucus
Chairman
Subcommittee on Environmental Protection
Committee on Environment and
  Public Works
United States Senate 20510-6175

Dear Mr. Chairman:

Enclosed are responses to the questions you submitted to Rebecca Hanmer, Acting Assistant Administrator for Water. These questions arose from the August 3rd hearing on coastal research and protection issues.

I hope this information will be helpful to you and the members of the Committee. If there is any further information we may furnish you, please do not hesitate to contact me.

Sincerely yours,

Charles M. Hassett
Acting Director
Legislative Analysis Division

Storm Water Discharges

Question 1: Is your proposal focusing on the priority problems caused by storm water discharges?

Answer: Section 402(p) of the Clean Water Act (CWA) establishes a phased approach for EPA to address storm water discharges under the National Pollutant Discharge Elimination System (NPDES) permit program. Section 402(p)(1) provides that EPA or NPDES authorized States cannot require a permit for most storm water discharges until October 1, 1992. However, the CWA provides for certain exceptions from this general prohibition. Section 402(p)(2)(E) allows for immediate permitting of storm water discharges which the EPA or the State determines contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. The Agency intends to issue guidance on implementing Section 402(p)(2)(E) in the near future. The guidance will encourage EPA Regions and States with authorizes NPDES programs to consider designating for immediate permitting storm water discharges that are associated with identified water quality problems such as beach closings.

The CWA also requires EPA to establish permit application requirements prior to October 1, 1992, for discharges from municipal separate storm sewer systems serving a population of 100,000 or more and for storm water discharges associated with industrial activity. On December 7, 1988, EPA published a notice of proposed rulemaking (NPRM - 53 FR 49416) addressing permit application requirements for these discharges.

Storm Water Discharges

Question 2: Why did you limit your program to incorporated municipalities?

Answer: The term "municipal separate storm sewer system serving a population of 100,000" is not defined in the CWA. This provided EPA discretion to define the scope of municipal systems consistent with the objectives of the program. The December 7, 1988, NPRM requested comments on a wide range of options for regulatory definitions of municipal separate storm sewer systems serving a population of 100,000, including basing systems on the boundaries of incorporated cities, counties, or Census designated areas with the appropriate population.

At the time of the proposal, the Agency favored defining municipal separate storm sewer systems serving a population of 100,000 or more to include municipal separate storm sewers that were owned or operated by incorporated cities with a population of 100,000 or more. In the NPRM, the Agency stated that it believes that this approach would provide for the initial development of core storm water management programs in the largest cities of the Nation. The Agency recognizes that many of these cities currently do not have comprehensive programs to address storm water quality. In addition, most of the NPDES States and EPA Regions have limited experience in addressing storm water quality management in the comprehensive manner that is envisioned. Because of the relative newness of the storm water NPDES program for discharges from municipal systems, the Agency anticipates that, generally, more effort may be needed to begin to implement the initial phase of the program. Further, the Agency believes that generally, larger incorporated cities are more capable of implementing for these programs, and therefore, the approach favored in the proposal provides a reasonable and realistic basis for the initial phases of development of this program.

The Agency is currently evaluating public comments received on the NPRM. In response to the public comments, the Agency is considering a number of options for promulgating a final definition of municipal separate storm sewer systems serving a population of 100,000.

Storm Water Discharges

Question 3: Is a storm water discharge less significant if it comes from an unincorporated area?

Answer: The nature of pollutants in storm water discharges depends on a number of factors, including the nature of land use activities within a watershed. Neither watersheds nor patterns of development necessarily follow political boundaries. In addition, the significance of storm water discharges also depends on the characteristics of receiving waters, which again is not related to political boundaries. The Agency is currently evaluating these and other factors in two storm water studies mandated by Section 402(p)(5) of the CWA. Based on these studies, the Agency, in consultation with State and local officials is required to issue regulations by no later than October 1, 1992, which designate additional storm water discharges to be regulated to protect water quality and establish a comprehensive program to regulate such designated sources. This program must, at a minimum, (A) establish priorities, (B) establish requirements for State storm water management programs, and (C) establish expeditious deadlines.

Combined Sewer Overflows

Question 1: Why haven't we yet permitted let alone controlled CSO discharges?

Answer: Since the inception of the NPDES program for point source pollution to our Nation's water the workload of issuing permits has required EPA to establish program priorities to address the most environmentally significant and manageable problems first. The Agency concentrated on discharges from industries and publicly owned treatment works (POTWs) in the early 1970's. There were also cost-effectiveness issues regarding CSO controls that led to major controversy in the mid-1970's and to Congressional restrictions on the use of Federal construction grants funds for CSO projects. In this atmosphere of conflict and confusion over the acceptable CSO technologies to achieve water quality benefits and the need to focus funding and enforcement on continuous flows from POTWs, the CSO permitting process bogged down. In the early 80's, priority was given to improving toxic controls in discharges from industrial and municipal facilities. However, with the advent of the National Estuary Program and other efforts that focussed on coastal pollution, CSO problems became evident and the Agency began to increase the priority of CSO permitting.

The Agency developed a strategy for controlling CSOs and published it in the Federal Register on September 8, 1989. The Strategy complements the program to regulate discharges from separate storm sewers. The policy addresses 1200 combined sewer systems in the country and between 15,000 and 20,000 CSO discharge points. The Strategy promotes a system-wide approach to deal with storm water including the implementation of source controls and flow reduction technologies, to reduce the amount of storm water entering the system, and, to require permitting of all CSOs and compliance with technology-based and water quality- based requirements. Thus, the Agency is currently focusing attention on both separate storm sewers and CSOs because many cities have both separate and combined sewer systems.

Combined Sewer Overflows

Question 2: Would you agree that CSOs are an important source of pollutants including floatables in the marine environment?

Answer: Yes. CSOs have certainly contributed to the marine debris problems; however, CSOs are not the sole cause of beach washups. Discharges from separate storm sewers and vessels as well as "blow off" from landfills and street debris may also contribute to the problem. Although floatable debris is a problem, the high levels of bacteria in the water due to CSO events often makes the water unsafe for swimming or shell-fish harvesting. The presence of other pollutants including contaminants from municipal wastewater and industry are also serious concerns.

Combined Sewer Overflows

Question 3: What is EPA's current policy for controlling these discharges?

Answer: The Agency believes it currently has adequate legislative authority to effectively control discharges from CSOs through the NPDES permit program. The Agency has developed a strategy for addressing CSOs. The National Combined Sewer Overflow Control Strategy was finalized on August 10, 1989, and appeared in the Federal Register on September 8, 1989 (54 FR 37370). The goals of the Strategy are:

1) To ensure that if CSO discharges occur, they are only as a result of wet weather;

2) To bring all wet weather CSO discharge points into compliance with the technology-based requirements of the CWA and applicable State water quality standards; and,

3) To minimize water quality, aquatic biota, and human health impacts from wet weather overflows.

The Strategy confirms that CSOs are point sources subject to technology-based and water quality-based requirements of the Clean Water Act. The Strategy prescribes minimum technology-based requirements but was designed to be flexible so that each city can develop a plan for bringing its CSOs into compliance while taking into account its own unique needs and priorities.

As for funding issues, many cities have and many more could address their CSO problems using local funds; however, EPA realized that the financial capabilities of cities faced with pollution problems attributable to their CSOs is varied. To supplement local funds, the CWA provides limited funding for cities in three ways: Section 201(g)(1) Governor's 20 percent discretionary fund; Section 201(n)(1) funding from a State's regular allotment for CSOs that are a major State priority and meet the water quality criteria in 40 CFR 35.2024; and Section 201(n)(2) special national fund, from a reserve of 1 percent of construction grants appropriated in FY 89 and FY 90, for marine CSOs that meet the water quality criteria in 40 CFR 35.2024. However, regardless of the availability of Federal or State funding, cities will need to address their CSO problems.

Pollution Prevention

Question 1: What changes are you making in your programs to implement the zero discharge goal of the Act and the directive from the President and Administrator to prevent the generation of pollution?

Answer: With respect to the zero discharge goal and implementation of pollution prevention, the Office of Water (OW) is both accentuating current activities and implementing certain new steps that address these points. While many previously promulgated effluent guideline regulations have been based, at least in part, on technologies that reduce the generation of pollutants and conserve water, we are taking steps to further institutionalize these considerations in the regulation development process. For example, our current project to revise the effluent guidelines for the pulp and paper industry is being based on technologies that eliminate or substitute for the chemical precursors of dioxin and other harmful chlorinated pollutants. We are including technologies developed in Sweden and Canada in investigating the pollution prevention opportunities that may be achieved by domestic pulp and paper manufacturers.

OW is also examining this issue with the goal of providing recommendations for legislative changes based on our findings. If we find that the Agency's authorities with respect to pollution prevention are unduly constrained by the Clean Water Act, we will provide the Congress with recommendations for changes.

OW is also conducting, with the Office of Policy, Planning and Evaluation, a retrospective study of how effluent guidelines have been implemented by some of the industrial categories with the greatest opportunities for pollution prevention and water conservation. This study will further document known methods for eliminating the creation of wastewater pollutants, and will be used by OW in developing regulations for specific industry categories.

Finally, the Agency is working with States to upgrade their procedures and programs to implement the anti-degradation provisions of State water quality standards. We believe we and the States can use this authority much more effectively to address new and increasing sources of pollutant discharges.

Pollution Prevention

Question 2: When permits are issued, do permit writers consider whether dischargers can prevent the generation of pollutants before they issue discharge permits?

Answer: Yes. In most cases, approaches taken by NPDES permit writers before issuing permits encourage pollution prevention. Many of the factors considered by the permit writer relate to the processes that generate pollutants as well as the corresponding water usage which contributes to the point source discharge. The diverse nature of municipal and industrial point sources prevents the uniform application of permit conditions to all of the different categories of point sources. Even though a baseline exists for issuing technology-based permits based on effluent guidelines, these guidelines do not regulate all pollutants that are discharged nor do they require controls that ensure that State water quality standards are met. Hence, permit writers must approach each facility on a case-by-case basis. The following approaches are commonly used by permit writers with respect to pollution prevention.

Product Recycling and Source Reduction

When a new point source is proposed for construction, permit writers have the opportunity to participate in the development of scoping meetings. These meetings provide permit writers the opportunity to promote the consideration of innovative and alternative wastewater treatment measures such as effluent recycling, in-plant chemical recovery, and flow reductions.

The most recently issued industrial effluent limitations guidelines prescribe the use of in-plant controls which would remove and/or recycle pollutants from waste streams prior to discharge to the end-of-pipe treatment system. The in-plant control technologies include steam stripping and recycling for volatile pollutants. These technologies reduce both the generation of pollutants and the potential for cross-media pollutant transfers, e.g., air emission of volatiles.

Product/Process Modifications

Permit writers have access to extensive documentation generated by the development of effluent limitation guidelines which deals with production processes and treatment. From this information permit writers may, through the development of permit conditions, encourage the selection of products and processes in such a way to prevent pollution. For example, permittees may choose to select different raw materials or catalysts and thereby reduce or eliminate specific pollutants.

Flow Reduction

Several effluent limitation guidelines impose concentration-based rather than mass-based limits. In these cases, permit writers must use best professional judgment to determine reasonable process wastewater flows for the conversion of the national concentration limits to appropriate plant-level mass limits. The promotion of wastewater flow reduction by permit writers usually results in the reduction of pollutant mass loadings to the environment.

Best Management Practices

For many years, EPA has incorporated Best Management Practices (BMPs) as NPDES permit conditions to control pollutants from such sources as precipitation runoff, spills, leaks, waste disposal, and raw material drainage that may contribute pollutants to receiving waters. Through procedures established in BMPs, the potential for the release of pollutants to receiving waters is prevented or minimized.

Pollution Prevention

Question 3: Why did EPA fail to consider the zero discharge goal in the case of the OCPSF regulations? (The Fifth Circuit Court of Appeals found that EPA had failed to evaluate whether new source OCPSF plants can achieve zero discharge of pollutants.)

Answer: The Agency did not overlook the goal of zero discharge of pollutants for this industry which consists of more than 1,000 plants manufacturing over 25,000 products through many combinations of more than 50 generic chemical processes.

More Stringent Treatement -- New source controls more stringent than BPT and BAT were considered but rejected because the incremental improvements were not sufficiently demonstrated for this industry (tertiary multimedia filtration for TSS control) or because of disproportionate costs for small incremental pollutant reductions (tertiary activated carbon for toxics reductions).

Flow Reduction -- Early in the OCPSF rulemaking process, EPA explicitly decided not to base its regulations on effluent limitations controlling the total mass of a pollutant discharged into the receiving water, and hence determined it would not attempt to place limitations on the wastewater flow (48 FR 11838-39; March 21, 1983). Rather, EPA determined that production based (including zero discharge) limitations would require extensive knowledge of the design and operating practices of the many thousands of product/processes, and the constantly changing nature of the product mix. Accordingly, the Agency did not devote its efforts to gathering information on design modifications, but rather focused its attention on the ability of treatment technology to accomplish effective removal rates.

The Agency concentrated heavily on the BAT options due to the complexity of the industry and due to the lack of demonstrated technology more stringent than the technology basis for the promulgated BAT limitations.

The litigation and Fifth Circuit remand focused on achieving zero discharge of pollutants through recycle technology. The OCPSF record indicates that 36 of the 939 plants in the data base use recycle technology for all or a portion of their process wastewater. The Agency has initiated efforts to determine if recycle or other zero discharge alternatives provide an appropriate basis for regulating any segment of the OCPSF industry.

Toxic Release Inventory

Question 1: What plans do you have to use the TRI data in your clean water programs?

Answer: The Office of Water is using or plans to use the TRI data in the following ways:

- To identify priorities for pollutant listing and delisting
- To select pollutants for Water Quality Criteris and Water Quality Advisory development
- To rank industries for Effluent Guidelines development
- To review State Water Quality Standards
- To review data reported in permit applications and in PCS (NPDES data base)
- To look for non-filers
- To review Section 304(l) submittals
- To evaluate vulnerability assessments of Water Utilities from upstream dischargers
- To cross check compliance with UIC Class I Priority.
- To identify priorities for Drinking Water criteria or advisory development
- To aid evaluation of Section 301(h) waiver requests
- To support National Estuarine Program decisionmaking
- To support Wellhead Protection Programs
- To assist evaluation of light industrial activities as ground-water contamination problems

A process is currently being established for developing an annual TRI workplan for the Office of Water and a process for monitoring the various OW programs offices use of TRI data in their programs. The monitoring process will result in semi-annual status reports on the use of TRI data in program activities and policy decisions.

EPA Comments on S. 587, 588, 1178, 1179

Question 1: When will EPA submit comments to the Committee on the coastal legislation that is being considered?

Answer: The Environment Protection Agency has commented on these legislative proposals and related issued in several hearings before the Committee this past summer. In general we commend the Committee's efforts to develop a comprehensive legislative proposal that addresses critical coastal water quality and resource problems. As Administrator Reilly stated in his October 17, 1989, letter to Senators Baucus, Chafee, and Lautenberg and Congressmen Studds and Nowak, we look forward to continiuing to provide technical assistance to the Congress in developing sound measures for protecting coastal and marine waters.

DEPARTMENT OF THE ARMY

OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

COMPLETE STATEMENT OF

DR. ROBERT ENGLER

BEFORE THE SUBCOMMITTEES ON

SUPERFUND, OCEAN AND WATER PROTECTION

AND

ENVIRONMENTAL PROTECTION

UNITED STATES SENATE

JULY 25, 1989

Chairman Lautenberg, Chairman Baucus, and members of the Subcommittees. I am Dr. Robert Engler, Senior Scientist from the Army Corps of Engineers Waterways Experiment Station. I am pleased to be here today on behalf of Assistant Secretary Page to discuss the issues you raised in your letter dated July 7, 1989. I will begin by discussing the Army's experience in working with the coastal and marine environments, and then will express our views on specific provisions of the four bills which are the subject of this hearing.

As you know, our Nation's coastal waters and estuaries are important biological and economic resources. Protecting and managing these resources is everyone's concern. We strongly support a cooperative effort to prevent degradation of coastal waters. We believe that Congress and the Administration can work together to improve the environmental quality of our coastal resources so they can continue to serve vital national interests such as providing food, recreational opportunities, and navigation.

As we understand it, S. 1178, the "Marine Protection Act of 1989", proposes to amend the Clean Water Act (CWA) and the Marine Protection Research and Sanctuaries Act (MPRSA) in an effort to expand regulation of activities in marine and coastal waters. Among other measures, this bill would identify and designate environmental protection and management goals; to establish numerical sediment criteria and standards for coastal waters; and to establish new regulatory strategies under both the MPRSA and the CWA for management of dredged sediments which are found to exceed such numerical sediment quality standards. S. 1179, the "Comprehensive Ocean Assessment and Strategy Act of 1989", is a companion bill, which would also require the development of numerical sediment quality criteria and standards. S. 587, the "Marine Research Act of 1989," proposes to amend the MPRSA by adding a new Title V which would establish regional marine research programs and a Regional Marine Research Oversight Board for all such established programs, comprised of ten Federal Agencies, including the Army Corps of Engineers. S. 588 would create the Regional Marine Research Trust Fund to provide funding for activities authorized in S. 587.

Before commenting on specific provisions of these bills, I would like to provide some background on Department of Army programs relating to the coastal and marine environment.

The Army administers two major civil works programs each of which play a critical role in the protection, management, and development of our coastal resources. First, the Army's dredging program fulfills the Congressional statutes regarding the maintenance of a safe and viable navigation system within the United States. This Army Corps of Engineers program is indispensable to the viability of the Nation's extensive system of commercial channels, harbors, and ports, which, in turn, is essential to the economic well-being and defense capability of the United States. At present, the importance of dredging to maintain critical navigation for national defense and the economy is clearly recognized in both the MPRSA and the CWA. We urge that any future amendments to these statutes continue to safeguard our ability to maintain important commercial and national defense navigation channels through dredging and disposal of dredged material in an environmentally responsible and economical manner.

Second, the Army operates a regulatory program also through the Army Corps of Engineers. This responsibility includes authority to regulate the discharge of dredged or fill material into waters of the United States under Section 404 of the CWA, all work and structures in navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899, and the transportation of dredged material for the purposes of ocean dumping under Section 103 of the MPRSA.

I would like to add that the Corps places a high priority on research to address environmental aspects of dredging and dredged material disposal and pursues an active program to foster beneficial uses of dredged material. We see this research commitment as a continuing high-priority requirement due to the complexity of evaluating sediment contamination and the environmental sensitivity of our waterways. The primary focus of Corps research and development activities on sediments is the Environmental Effects of Dredging Program. This research is directly related to our responsibility to maintain and improve navigation and to regulate dredged material disposal in waters of the United States in both a cost-effective and environmentally sound manner.

Since 1973, the Corps has expended over $100 million for research and development to generally support our navigation and regulatory missions. We currently are expending about $1.2 million each year on research activities specifically related to highly contaminated sediments. Our past efforts and current research serve to maintain Corps leadership in development of innovative approaches to the management of dredged material and enable us to coordinate related Federal, state and private sector research on contaminated sediments.

The Corps presently is the construction agent for the Environmental Protection Agency (EPA) under the SUPERFUND program and our testing protocol and management strategy is being used by the EPA at a number of SUPERFUND sites where dredging has been identified as a potential clean-up measure. The protocol and strategy are the product of 16 years of intensive geochemical and biological research and development on contaminated sediments and have recently been applied to a full scale pilot demonstration of assessment, removal, and containment of highly contaminated sediment at the New Bedford, Massachusetts SUPERFUND site.

I also add that a beneficial spin-off of our research effort to date, and one which is quite gratifying to me, is that the Corps is now recognized internationally as a leader in all aspects of dredging-related environmental research. Indeed, other nations actively seek the Corps' advice on environmental and engineering aspects of dredging and dredged material disposal matters, including dredging and disposal of highly contaminated bottom sediments. We plan to continue this emphasis on research in order to ensure that we continue to make the best possible decisions concerning the disposal of dredged material.

You will note that my comments in this testimony support a unique treatment of dredged sediments as compared to other materials which have been, or continue to be, disposed of in our waters. Based on years of scientific investigation and experience, such unique treatment has evolved because, (1) dredged sediment is predominantly natural mineral soil material and (2) our research programs and practical experience in regulating dredged material disposal activities and placement of material for beneficial purposes have yielded substantial data which support such a treatment. Additionally, the London Dumping Convention (LDC), a treaty signed by 61 nations regulating all ocean disposal, has adopted unique guidelines for dredged material evaluation and management that recognize those special characteristics and significant research base. We have adopted and follow the LDC protocol.

At present, our national dredging program involves the removal, disposal, and management of about 300 million cubic yards (mcy) of dredged sediments each year to maintain this nation's extensive Federal waterways navigation system. This National system includes over 25,000 miles of Congressionally-authorized and Federally-maintained navigation channels serving 41 of the 50 states. Nationwide, another 100-150 mcy of sediments are dredged and disposed of each year under permits issued by the Corps of Engineers.

Specifically within coastal waters, some 200-250 mcy of sediments are dredged each year by both Federal and non-Federal interests. Of this volume, about 60 mcy of dredged sediments require disposal at ocean sites each year. We presently have 105 active ocean dredged material disposal sites serving 98 coastal navigation projects and some 40 to 45 active ocean disposal permits. Of our active ocean disposal sites, 58 are within the three-mile territorial sea with most of the remainder being located within 5 miles of shore.

If the sediment that we dredge to construct or maintain a project is believed to be contaminated, we perform state-of-the-art biological and chemical evaluations which were developed in conjunction with the EPA to predict the effects on the environment. These tests, known as bioassays, are performed in a simulated marine environment and are designed to determine the potential impacts of the contaminants on aquatic plants and animals. We use the term "highly contaminated" to refer to those dredged sediments which have the potential for environmental harm and which require some level of special handling or restrictions upon disposal. Such special restrictions may include the need to confine contaminated material in upland sites or "cap" the material with clean sediments in open water disposal sites.

Only 1 to 3 percent of the sediments we dredge each year fall within the category of "highly contaminated." While the percentage is small, the actual volumes requiring special handling are still significant, ranging from about 3 to 10 million cubic yards each year. The small percentage associated with our Federal program is not surprising when one considers that most Federal channels have been periodically dredged for many years. Also, these channels are often located in high energy areas of our waterways and are subjected to frequent turbulence which collectively tend to minimize contaminant buildup. Moreover, recently deposited sediments tend to be cleaner due to the improvement of the regulation of point and non-point discharges. Highly contaminated dredged sediment usually is found in heavily industrialized inner harbor areas and channel reaches which have not been dredged for many years and where point and non-point discharges were not properly controlled.

The Department of Army believes that there is no need to substantively alter either the CWA or the MPRSA at the present time with regard to the specific technical provisions which regulate dredged material disposal. The Army believes that these statutes now provide for well-reasoned consideration of all practicable alternatives for the disposal of dredged material through scientifically valid assessment protocols.

Currently, the CWA and MPRSA use slightly different approaches to evaluating sediments in dredging proposals. We are working intensively with EPA to develop a comprehensive coastal disposal management strategy and associated technical implementation guidance for all dredged material disposal activities undertaken within the coastal area. Our proposed approach in this area is to develop a consistently applied evaluation framework for sediment contamination testing and to provide effective controls of contaminated sediments for the full array of available disposal options. In order for this strategy to be effective, it is necessary to consider all practicable alternatives to ensure overall coastal environmental protection while using cost effective technologies. No disposal option is categorically better than another as operational, economic, environmental and social factors vary greatly among dredging projects. Moreover, the physical, chemical, and biological characteristics of sediments vary significantly from one waterway to another and even within an individual waterway. The differences reflect natural mineral and water quality heterogeneity as well as the nature of past and present pollutant discharges and sources in the area. In the specific case of dredged sediments, a comprehensive coastal disposal management strategy for dredged material incorporating this significant variability is not only scientifically justified, but also is essential in providing for the sound and effective management of all coastal dredged material disposal activities.

Only an approach as outlined above captures the significant variability and complexity found throughout natural sediment water systems and the broad array of management alternatives. A numerical sediment quality criterion for either a single chemical or groups of chemicals could easily overstate or understate the potential for an environmental problem in an unknown fashion. This is because natural mineral sediments have a significant capability to trap and retain contaminants in forms which are nontoxic and not biologically available to aquatic organisms. The mineral structure of sedimentary clays, the organic matter content of sediments, pH, redox potential, and salinity are important physio-chemical characteristics of natural sedimentary soil materials that set dredged material apart from other materials when selecting an appropriate disposal alternative. These physio-chemical characteristics, the concentrations of contaminants, and the potential disposal site characteristics vary widely within and among waterways of the United States. Consequently, the potential effects of sediment placement at a specific site or sites cannot be predicted by numerical criteria alone nor can the proper alternative be selected based solely on such criteria.

The following comments refer specifically to S. 1178 and Section 7 of S. 1179.

We recognize that contaminated sediments can be a problem in the environment. We also realize that the activity of dredging involves the removal of sediment deposits from one location to another, and where contaminated sediments are involved, this can present a risk to the environment. However, it is our view that current environmental reviews, which are completed under existing laws which relate to dredging proposals, whether accomplished by the Federal government itself or by private industry under Federal permits, provide for adequate consideration and protection of environmental and public health and safety interests. We believe that the problems that existing in this area can best be addressed by more effectively controlling and regulating the sources which have generated the contaminants and caused the pollution. In most instances, neither the Corps nor the dredging industry has caused the pollution and is the unwilling recipient of the contaminated sediments. Our general impression is that under S. 1178, the navigation/dredging community would bear the burden of correcting the discharges of others in all future cases where coastal sediment contamination problems are encountered.

A major emphasis of S. 1178 and of Section 7 of S. 1179 is a requirement for EPA to develop numerical sediment quality criteria. These criteria would, in turn, serve as the basis for establishing numerical sediment quality standards which would then be used to regulate dredged material disposal within coastal and marine waters. We strongly oppose this proposal on both technical and procedural grounds.

The use of sediment quality criteria to evaluate dredged material is not a new issue. Sediment quality criteria were used as pass/fail standards in the Great Lakes in the early 1970's by EPA and others and as screening guides in other regions of the U.S. Primary reliance on this approach was rejected as technically unsound by the EPA and the Corps in their joint promulgation of the CWA 404 (b) (1) Guidelines and the MPRSA 103 Criteria. Research and the scientific consensus at that time supported an effects-based approach in evaluating sediments, and current research still supports this approach.

At the present time, it may be beyond our technical knowledge to development scientifically-based numerical sediment quality standards that embrace a thorough knowledge of cause-and-effect relationships of sediment-associated contaminants. The geochemical interrelation of sediments and surface waters is extremely complex and cannot presently be quantified such that the concentration of a single chemical or group of chemicals in a sediment matrix of natural and man-made components can be related to an impact of an in-place contaminated sediment. As stated earlier, this subject recently was given significant attention by the London Dumping Convention, resulting in the development of a separate technical annex for testing and management of ocean dredged material disposal, and by the Marine Board of the National Research Council. It is presently under review by EPA's Scientific Advisory Board. The conclusion of all such scientific studies to date has been that effects-based testing (acute and chronic bioassays), using a broad array of tests, is the only scientifically valid and defensible approach that can effectively be applied in regulatory decision-making for proposed dredged material disposal activities. This effects-based testing is the approach taken under current law.

There are, however, several promising but still very theoretical and scientifically unverified approaches that the scientific community, including the Corps, is pursuing in the area of numerical sediment quality guidelines. It should be clearly emphasized, however, that these approaches are limited at present to only certain classes of chemical contaminants. A number of the underlying assumptions are poorly understood at the present time, and careful field verification using scientifically accepted procedures and protocols has yet to be accomplished. Unless, or until, these shortfalls are overcome, this concept of numerical sediment criteria creates an unacceptable potential for either overregulation or underregulation of proposed dredged material disposal activities. For the immediately foreseeable future, the greatest potential utility of this concept would be for comparing the relative severity of in-place sediment contamination among different locations within the same waterbody, or, possibly as a broad indication of the severity of contamination in case-by-case regulatory decisions leading to the need to conduct detailed effects-based testing.

In addition, the numerical sediment quality standards contemplated in S. 1178 would be promulgated by states and would be pass/fail in nature. Because the standards would be implemented primarily through Section 401 of the CWA, Federal projects would have to comply as well as permittees. In practice, if a dredged sediment were to fail one or more state-established numerical standards under the provisions of this S. 1178, the only available options for disposal would either be upland confinement at significant expense or ocean disposal seaward of the 3 mile limit. This would be the case regardless of whether the coastal waterbody is classified as degraded or not under Section 101, and regardless of the impacts to navigation or the relative environmental impacts associated with these various disposal options. In our view, an essential but missing requirement in this bill is the ability to continue to carefully safeguard critical commercial and national defense navigation requirements. From both an environmental and economic standpoint, we must also continue to retain the flexibility to effectively manage dredged material disposal through the full weighing and balancing of all practicable alternatives on an equal basis to determine environmentally sound practices. The proposed numerical pass/fail criteria, particularly in light of the absence of scientific evidence to support the concept, can only serve to further promote an approach to dredged material regulation and management which is extremely inefficient, unnecessarily costly, and environmentally unsound.

We are also particularly concerned with Section 203 of S. 1178 which would delete Section 106(d) of the MPRSA and allow states to regulate ocean dumping activities by establishing stricter criteria and regulations for ocean dumping than those established in the MPRSA. Currently, Section 106(d) prohibits states from adopting or enforcing rules or regulations relating to ocean dumping activities regulated by the MPRSA, while allowing state input into EPA's ocean dumping criteria. We believe that the specific preemption of state regulation in ocean dumping found in Section 106(d) ensures a unified, consistent, and equitable ocean dumping program nationwide and should be retained. The Corps' activities as they relate to ocean dumping are unique and highly technical, and the Federal government is best suited to balance the complex scientific and environmental concerns of ocean dumping with the important interests of navigation and national defense. Allowing states to establish stricter criteria or regulations relating to ocean dumping will unnecessarily complicate the ocean dumping regulatory process and may result in different state standards that are economically infeasible and scientifically questionable.

Furthermore, the amendments to Section 303 of the CWA, set forth in Section 106 of the bill, allow for the individual states to adopt more environmentally stringent numerical sediment quality standards if they elect to do so. This provision is quite troublesome for several reasons. First, this imposes the cost burden on navigation interests for any and all discharges of chemical contaminants into state waters, both regulated and unregulated, regardless of who is responsible for the discharge. The bill seems clearly to impose more stringent environmental standards (through imposed numerical sediment quality criteria) on dredged material disposal in coastal and marine waters than present Federal environmental statutes, which employ a non-degradation regulatory philosophy. In contrast, Section 102 of S. 1178, which adds a new paragraph q(1)(B) to Section 301 of the CWA, would only require that even for "degraded coastal waters", ..."proposed new discharges [other than dredged material] or any increase in volume or toxicity of an existing discharge, will be offset by a decrease in other discharges or loadings to the waterbody resulting in no net increase in pollutant loading to the waterbody." This in our view imposes a much heavier burden on navigation interests as opposed to the actual generators of this sediment contamination. The potential for wide variations between state standards, and, in turn, the costs to navigation and the U.S. taxpayer for required compliance, would be quite great.

We fully recognize and support the right of individual states to establish, within limits, their own priorities as to primary uses of state waters. However, we also recognize that the U.S. port industry is highly competitive. This bill will likely force a number of the less competitive ports out of business since many smaller ports cannot afford the extraordinary dredged material disposal requirements from more restrictive, but not necessarily more environmentally sound, disposal criteria.

Additionally, with the current budget deficits and increased disposal costs, dredging of some Federal navigation projects may have to be deferred. Notwithstanding the potentially significant increased costs to the Federal taxpayer to maintain navigation, and the critical concern of adequate safeguards for essential Federal navigation raised by this provision, this proposed approach raises serious questions both in terms of significant and perhaps full Federal subsidies for clean-up of state waters. In our view, there must be a consistent national (Federal) standard incorporated into any such concept to be used as basis for Federal funding and compliance. In turn, the individual states must assume a greater level of accountability in imposing any such additional standards, criteria, rules or regulations by demonstrating their willingness to share a significant portion of the additional costs of compliance.

As I have stated, we oppose the establishment of numerical sediment quality standards for dredged material. But if the Congress wishes to pursue this concept, it must be done cautiously and as a long term commitment. As evidenced from other similar and technically much less complicated programs such as required development of water quality and sewage sludge standards, a two-year deadline for EPA to establish criteria for sediments is unrealistic. Our own estimate, based on experience, is that such an initiative would take substantially longer and would be very costly to fully implement.

Furthermore, we are particularly concerned about the proposed amendments to Sections 102 and 103 of the MPRSA regarding the regulation of ocean disposal of dredged materials. Section 202(a)(3) would remove the permitting of dredged material which fails the numerical sediment standards from the Corps' Section 103 permitting process and transfer it to EPA's Section 102 permitting process. Section 202(b) of S. 1178 would also amend the MPRSA by requiring EPA to develop special management of contaminated dredged material. We believe that these new provisions for the regulation and management of the disposal of contaminated dredged material in coastal and marine water is unnecessary and inappropriate. The Corps of Engineers has extensive experience and expertise in the testing, managing and disposal of contaminated dredged material. A transfer of the permitting of the ocean disposal of this material to EPA would complicate the regulatory process without providing any new environmental benefits. We have already imposed by regulation many of the measures proposed in Sections 202 and 204 of S. 1178 on ourselves for both Section 404 and 103 discharges of dredged material, through our "Management Strategy for Disposal of Dredged Material: Contaminant Testing and Controls". This same approach has been adopted by EPA Region I in its SUPERFUND Project at New Bedford Harbor and we are presently working with EPA to incorporate this strategy into jointly developed technical implementation guidance for managing dredged material disposal in coastal and marine waters.

In addition, Section 204(a) creates numerous new requirements for the designation and monitoring of ocean dumping sites. Monitoring of the kind called for in Section 204(a)(3) of the bill is already required by the London Dumping Convention for ocean sites requiring special management of contaminated sediments. We are in full compliance with these international requirements and routinely provide data and results of all such monitoring efforts to the London Dumping Convention.

We are also concerned that site management requirements prescribed in Section 204(a) (new Section 102(c)(3) of the MPRSA) would be applicable to all ocean dredged material sites designated by EPA, not just sites requiring special management due to chemical contamination concerns. This level of monitoring is technically unjustified for the vast majority of ocean dredged material disposal sites and therefore entails an unnecessary expense.

This same Section (204(a)) also would amend Section 102(c) of the MPRSA to require formal redesignation of all ocean dredged material disposal sites every five years. This in our view is an unnecessary administrative burden on all concerned. EPA's formal ocean site designation procedure is extremely time and resource intensive. This is evidenced by the fact that some 58 of our active, historically-used ocean dredged material disposal sites have not yet received final designation status, almost 13 years after the procedure was established by EPA. Furthermore, EPA already has ample authority to terminate or strictly limit the use of any such ocean disposal sites if an unacceptable impact appears imminent. Two very recent examples of this existing EPA authority are Yaquina Bay, Oregon, and Humboldt Bay, California, where, the ocean sites in question were either terminated or their use was strictly limited due to unforeseen mounding and potential threats to navigation.

Further, section 204(b) of the bill would require that MPRSA permits be limited in all cases to a period not to exceed two years. This also represents an unnecessary cost and administrative burden in the vast majority of ocean dredged material disposal activities. We recommend first that time limits be governed by administrative rulemaking. But if the Congress is intent on setting a requirement in law, then we recommend a minimum permit duration of 3 years as is currently the practice recommended in Corps regulations, with the flexibility for longer or shorter duration based on permit or site-specific considerations. Regulatory procedures are in-place to appropriately condition individual permits to specify required periods of reassessment and testing based on permit-specific contamination and any other environmental concerns.

In addition, Section 204(c) of the proposed bill severely limits the waiver provision of the MPRSA. Currently, the Secretary of the Army may seek a waiver of requirements of EPA's ocean dumping criteria if such requirements are not economically feasible. The bill would allow for a waiver from meeting the requirements of the site management plan only where the Secretary of the Army determines that such waiver is necessary for national defense. To date, no formal waiver proceedings under existing provisions of Section 103(d) of MPRSA have ever been initiated by the Secretary of Army. However, in our view this in no way diminishes the continuing need for this provision as presently written. Given that the proposed bill would impose potentially much stricter environmental standards on ocean dredged material disposal than at present, and the fact that our ability to weigh and balance potentially detrimental impacts to critical navigation is removed for dredged sediments that fail numerical sediment quality standards, the existing waiver provision and language of Section 103(d) of the MPRSA is essential.

Section 205 of S. 1178 would have the Administrator develop sediment testing procedures for Section 404 of CWA discharges. Although there is currently a provision in the Section 404 (b)(1) guidelines (Subpart G) for testing, this provision needs improvement. I would support efforts to develop such procedures, provided that development of the procedures was done by EPA in conjunction with the Corps, and provided that the procedures contain some risk assessment approach to help ensure against unnecessary testing.

Section 205 of the bill would require that the Secretary deny a Section 404 permit application in any case where the material fails established numerical sediment quality standards, if the proposed disposal site is located in a designated degraded coastal waterway. It should be pointed out that a designation of "degraded" may or may not be based on sediment chemical contamination. Further, as these numerical standards are to be adopted as minimum State standards under Section 401 of the CWA, the permit must be denied in all cases when the standards are exceeded unless waived by the State. It is unclear from the language of the bill whether the individual states have the right or flexibility to waive one or more such standards on a case-by-case basis.

In summary, Mr. Chairman, I believe these stricter standards on disposal as proposed in S. 1178 would place an unnecessary burden on the dredging community and may not provide the environmental protection which the legislation seeks. The Army, as does the Congress, supports efforts to protect the coastal environment in a reasonable and responsible way. We believe we can best do this by not limiting the flexibility of decision-makers to choose the best alternative on a case-by-case basis after weighing all aspects of the public interest. Carrying out a dredging and disposal program under the rules described in S. 1178 and S. 1179 would lead to many inefficient and expensive procedures regarding dredged material disposal with little benefit to environmental protection. And while we support passing on to states much of the management responsibilities for their natural resources we are concerned about maintaining the nation's need for safe and efficient interstate commerce.

Regarding S. 587 and S. 588, while we support efforts to coordinate research in the nation, we believe there is already considerable exchange between Federal and state agencies and additional legislation is not needed in this area. We do not believe that a committee of ten Federal agencies can provide effective guidance or focus and management to achieve the most effective use of the research funds provided. We believe the goal can be better accomplished with less of an administrative burden than described in these bills. Many Federal agencies already have research and development programs in place, and we would suggest investing in these existing programs rather than incurring the overhead costs and duplication which will likely accompany the proposed coordinating boards.

This concludes our testimony Mr. Chairman. I would be happy to answer any questions.

Expanding and Strengthening Programs for Research and Protection of Marine and Coastal Waters

Joint Hearing by the
Subcommittee on Superfund, Ocean and Water Protection
and the
Subcommittee on Environmental Protection
Committee on Environment and Public Works
United States Senate

July 25, 1989

Testimony of
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Senators Lautenberg and Baucus and members of the Committee, I am Dr. Donald F. Boesch and I appear before you to represent, as best I can, the views of the marine research community concerning the need for improved scientific knowledge as a critical element in our efforts to more effectively protect marine and coastal waters.

I am a biological oceanographer who has been actively engaged in research on the effects of human activities on the marine environment as well as in more basic studies. Among my several organizational affiliations, I am President of the Estuarine Research Federation on the behalf of which I appear today.

Although I will briefly address the need for strengthening programs for protection and restoration of marine and coastal waters, such as proposed in the Marine Protection Act (S.1178) and Comprehensive Ocean Assessment and Strategy Act (S.1179), my comments will chiefly focus on research and monitoring as a critical element of our marine environmental protection efforts. Specifically, I will summarize the views of the marine research community on the proposed Marine Research Act and Marine Research Funding Act (S.587 and S.588) as represented in a more detailed statement included with my written testimony. This statement was produced by a forum of representatives of the major professional societies and national associations of marine researchers, including the American Society of Limnology and Oceanography, the Council on Ocean Affairs, the Estuarine Research Federation, Joint Oceanographic Institutions, Inc., the National Association of State Universities and Land Grant Colleges, the Sea Grant Association, and the Southern Association of Marine Laboratories. Together, these organizations represent the vast majority of U.S. marine researchers in academia and many additional scientists in government agencies and industry.

The serious degradation of many estuarine and coastal ocean environments, despite tighter environmental regulations during the 1970s and 1980s, was highlighted last year in the press, at hearings by this Committee and others in Congress, and in numerous scientific assessments. Even though certain trends are alarming, it is important to also note that these tighter environmental regulations have resulted in numerous improvements in coastal waters, particularly through point-source control. Nonetheless, degradative trends elsewhere reveal not only the shortcomings of some of our management approaches, but also the lack of adequate knowledge about how coastal marine ecosystems work and are affected by human activities.

Clearly, improved management strategies and research and monitoring are called for. These improvements go hand-in-hand. With improved understanding provided by research, control strategies may be made more effective. Well designed monitoring serves as validation of the strategies and a barometer of trends and conditions, both natural and human-induced.

In reviewing S.1178 and S.1179, as well as related legislation offered by Mr. Studds in the House of Representatives (H.2647), several commonalities emerge: requirements for marine water and sediment quality criteria and standards, more aggressive control of diffuse sources of pollution, and calls for more and more effective monitoring. All require significantly extending our scientific understanding and its technical application.

The development of meaningful water and sediment criteria requires improved knowledge of chemical fate, biological uptake and sublethal effects of pollutants. In the development of marine sediment criteria for organic pollutants, for example, one has to have an appreciation of the rates of degradation of compounds, the nature of the degradation products, burial and resuspension rates, and bioavailabilty of contaminants adsorbed onto sediment particles under realistic environmental conditions.

Although we have had some successes in control of point sources of pollution, evidence is building that large scale environmental degradation is frequently resulting from diffuse, non-point sources. Consequently, the proposed strengthening of programs to deal with combined sewer overflows, coastal land use, agricultural practices and airborne pollutants is on target. Important diffuse sources not specifically addressed in these bills are those contributing to riverine imputs. The "dead zone" phenomenon in the Gulf of Mexico, referred to in the letter inviting my testimony, may be an example of the large scale and dramatic effect the tremendous overenrichment of the nation's rivers may be having in coastal waters. Similar phenomena have now been observed in coastal waters in northern Europe, the Adriatic and Black Sea, all thought to be related to increased nutrient loading primarily from agriculture and atmospheric deposition of combustion products. This kind of issue is particularly appropriate to the regional marine research approach authorized by S.587.

I should note with regard to marine environmental monitoring that I am chairing a National Research Council committee on this very subject. Although our report is not yet complete and I cannot at this time share our conclusions, it is my opinion that more effective regional-scale monitoring of environmental trends is particularly needed. Furthermore, much monitoring in the past has not been carefully designed to answer specific questions as an integral part of a management system. The development of protocols--if not inappropriately rigid--and requirements for a national assessment strategy as required by S.1179 should help in this regard. Additionally, coordinated monitoring under the National Estuary Program (S.1178) would make this tool more useful in environmental management. Monitoring should, however, be coupled with research. Otherwise, because of the interaction of natural and human-induced processes, inappropriate conclusions may be reached based on monitoring observations. An example comes from the Chesapeake Bay Program. Initially, it was thought that the disappearance of submerged grass beds in the bay was due to the coincident increased use of herbicides--monitoring observations would suggest that. However, through allied research programs it was discovered that the disappearance of the grass beds was more related to nutrient enrichment which caused increased microscopic plant growth, effectively shading the grasses.

Now let me turn specifically to the Marine Research Act (S.587). The principal points raised by our marine research forum reviewing this legislation are as follows:

1. The focus of the bill on research at the regional level fills a critical need. Many emerging environmental problems, for example involving atmospheric and riverine inputs and the effects of global environmental change, do not know geopolitical boundaries. In addition, there is wisdom in approaching research and management questions in similar environments within biogeographic regions based on common models which allow transfer of information and understanding from one part of the region to the other. Existing programs, including Sea Grant and the National Estuary Program, are principally organized to focus on the state or local level.

2. We believe that the scientific community supports the initiative for regional marine research provided it does not diminish the limited resources presently available for worthy federal research programs. The establishment of a Regional Marine Research Trust Fund under S.588 would provide financial support for the research programs from appropriate sources outside of the general treasury. In addition, the proposed Act acknowledges and builds upon extant resources, including the National Sea Grant College Program and active research institutions, rather than creating completely new infrastructure.

3. The Great Lakes should be included under the bill as it is included in other ocean research and management legislation, including those enabling Sea Grant and Coastal Zone Management.

4. Because of the different objectives, design criteria and time scales of research and monitoring, we suggest that this Act explicitly focus on regional marine research and that monitoring and baseline assessments be more effectively implemented through amendments of the Water Quality Act.

5. We recommend against the *a priori* designation of institutions eligible to participate which may preclude some very innovative research carried out at smaller institutions. Open competition and peer-based merit review, rather than preselection, are the most effective means by which to select research projects.

6. The major concern of the research community with the current bill is the layers of additional bureaucracy it potentially puts between the research community and support for regionally-directed marine research. Consistent with the execution of regional marine research planning and coordination, insuring the relevance of research, and strong peer review, the provision of financial support for research should be streamlined to minimize administrative overhead. We provide in our statement some suggestions for improvements in this regard.

7. All research supported under the Act should be judged technically sound by objective merit review by scientific peers.

Mr. Chairmen, this concludes my remarks. I wish to thank you for the opportunity of appearing before you on this important subject.

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PROPOSED LEGISLATION CREATING THE MARINE RESEARCH ACT OF 1989 AND THE REGIONAL MARINE RESEARCH TRUST FUND

VIEWS FROM THE MARINE RESEARCH COMMUNITY

INTRODUCTION

Legislation has been proposed to the 101st Congress which would amend the Marine Protection Research, and Sanctuaries Act of 1972 to protect the marine environment through the establishment of regional marine research programs. Senate bill S.587 has been offered by Senator Mitchell of Maine, joined by 18 co-sponsors. Its companion, H.R.1421, has been offered by Mr. Brennan of Maine, joined by 28 co-sponsors, in the House of Representatives. In addition S.588, also offered by Senator Mitchell, would establish a Regional Marine Research Trust Fund to provide financial support to the regional marine research programs authorized under S.587.

In order to provide a viewpoint which reflects that of the national marine research community, representatives of several professional societies and national associations met on May 11, 1989. These societies and associations included the American Society of Limnology and Oceanography, the Council on Ocean Affairs, the Estuarine Research Federation, Joint Oceanographic Institutions, Inc., the National Association of State Universities and Land Grant Colleges, the Sea Grant Association, and the Southern Association of Marine Laboratories. Together these organizations represent the vast majority of U.S. marine researchers in academia and, through the professional societies, many additional marine scientists in government agencies and industry.

Although the statement below has not been formally approved by the organizations listed above, we believe that the statement is a fair reflection of the views of the vast majority of the marine research community. However, it should be recognized that these organizations and the individual scientists and institutions they represent may have divergent views in terms of the specifics of the proposed legislation.

THE NEED FOR REGIONALLY COHERENT MARINE RESEARCH

The central proposal of the Marine Research Act of 1989 (S.587) is very timely and addresses a need that requires urgent attention: the more effective protection and husbandry of marine and nearshore coastal waters. The serious degradation of many estuarine and coastal ocean environments, despite tighter environmental regulations during the 1970s and 1980s, was highlighted last year in the press, at hearings in both houses of Congress, and in numerous scientific assessments. These trends reveal not only the ineffectiveness of some of our management approaches, but also the lack of adequate knowledge about how coastal marine ecosystems work and are affected by human activities. The recognition by members of Congress that a concerted effort to increase, improve and sustain marine research in the coastal ocean as part of our efforts to protect and clean up the environment is encouraging to our community and is strongly supported by our own analyses.

The focus of the bills on research at the regional ecosystem level fills a critical need. Existing programs, including Sea Grant and the National Estuary Program, are principally organized to focus on the state or local level. Funding constraints (including both cutbacks at the federal level and the effects of state/local matching requirements) have hampered many of Sea Grant's efforts toward regional programming. Many emerging environmental problems, for example involving atmospheric and riverine inputs and the effects of global environmental change, do not know geopolitical boundaries. In addition, there is wisdom in approaching research and management questions in similar environments within biogeographic regions based on common models which allow transfer of information and understanding and merit review. The regional approach also affords opportunities for priority setting for research in a way that preserves regional equity.

FUNDING AND USING EXISTING INSTITUTIONAL RESOURCES

We believe the scientific community would support the initiative for regional marine research provided it does not diminish the limited resources presently available for worthy federal research programs. In that regard, we note that S.588 seeks to establish a Regional Marine Research Trust fund to provide financial support for the research programs. This funding vehicle would be derived from an extension of a pre-existing revenue source which creates no new tax burdens, and does not contribute to the federal budget deficit.

In addition to proposing an innovative funding source, the Marine Research Act acknowledges and builds upon extant resources. These include national programs like the National Sea Grant College Program and active research institutions. The facilities and intellectual resources of our existing marine research institutions must be the base for any enhanced program. Through the effective use and enhancement of current institutions, more time and resources can be put towards addressing the purpose of the bill--regional marine research.

MARINE RESEARCH REGIONS

S.587 defines ten regions for which regional marine research programs are to be developed. The individuals and institutions we represent are widely distributed in these regions. Because there is a diversity of local views among these individuals and institutions concerning the appropriate size and boundaries of the regions and the relative research support requirements for each, our forum took no position on these issues, with one exception. That exception is to recommend the inclusion of a Great Lakes region in the Act. The inclusion of the Laurentian Great Lakes is consistent with many Federal statutes dealing with marine environmental protection, coastal zone management and research. Great Lakes research is included in the Sea Grant Program and is supported by the National Science Foundation's Division of Ocean Sciences.

AREAS OF INVESTIGATION: RESEARCH AND MONITORING

Thirteen areas of investigation are listed as authorized under these bills. These areas include both practical research directed at understanding effects of contaminants, including nutrients, and habitat modification, and more basic fundamental research on physical, chemical, geological and biological processes in the coastal ocean. This mix and potential for integration of studies is refreshing. Basic research in the coastal ocean, particularly on a regional scale, has received very little sustained support in this country. Lack of basic understanding has interfered with our ability to predict present and future changes in the environment resulting from human activities. It has also constrained the design and implementation of sound, effective monitoring programs.

Included in these identified areas of investigation are baseline assessments and environmental monitoring. The demands for marine environmental monitoring are growing as a result of public concern about environmental degradation. It should also be noted that there are other new Congressional proposals which deal specifically with marine environmental monitoring on a regional scale (for example H.R. 2647 by Mr.

Studds) and would provide innovative funding mechanisms from discharge fees, pollution fines, etc., so that the user pays for this important service.

Thus, the marine scientific community strongly endorses both enhanced research and improved monitoring in our coastal oceans. However, because of the different objectives, design criteria and time scales of research and monitoring, we suggest that the Marine Research Act explicitly focus on regional marine research and that monitoring and baseline assessments be more effectively implemented through amendments of the Water Quality Act. At the same time, we urge Congress to foster the effective integration of both components, research and monitoring, wherever they can complement one another. For example, research programs under the Marine Research Act should contribute to an effective interface between research and monitoring by supporting 1) limited monitoring required to address research questions; 2) research into more effective monitoring approaches; and 3) research which facilitates the interpretation of monitoring results. In a similar vein, monitoring programs under the amended Water Quality Act can contribute to this integration by supporting 1) limited augmentations to monitoring locations and measured parameters which will contribute significantly to the research database; 2) additional research into more effective monitoring approaches; and 3) the acquisition wherever feasible of data whose quality is suitable for environmental research purposes.

OPEN OPPORTUNITIES FOR PARTICIPATION

The bill seeks to ensure credible scientific research through the *a priori* designation of institutions eligible to participate in funded activities. This roster is to be submitted as part of the plan for a regional marine research program. The development of a select list may, however, prove counter-productive by creating perceptions of this program as a clubbish activity and by discouraging innovative proposals from other than main-line institutes. While it is true that in most regions most expertise is concentrated within a few institutions, experience with Sea Grant programs has shown that often very innovative and effective research is proposed and carried out at smaller institutions. Open competition and peer-based merit review which is fair and objective are the most effective means by which to select research projects.

ADMINISTRATIVE MECHANISMS

A major concern of the research community with the current bill is the layers of additional bureaucracy it potentially puts between the research community and additional funding for regionally-directed marine research. Consistent with the execution of regional marine research planning and coordination, insuring the relevance of research, and strong peer review, the provision of financial support for research should be streamlined to minimize administrative overhead.

Toward the ends of making the process of Regional Marine Research Boards more efficient in supporting high quality, relevant research, we make the following suggestions:

- The Regional Organizing Committees should call regional organizing meetings for soliciting input regarding the constitution of Regional Boards and development of a planning process.

- To reach a balance between strong state involvement and high scientific integrity, regional proposals regarding the overall content and organizational structure of Regional Marine Research Boards should be endorsed by a majority of regional governors before being forwarded to the National Board, but programmatic and funding decisions should rest with the Regional Marine Research Boards.

- Members of the Regional Marine Research Board should be individuals experienced in scientific research or in the direct application of scientific research to environmental and resource management. These individuals must be able to design innovative scientific research and weigh the merits of technical research proposals. Appropriate input to the definition of regional information needs from Federal and State management or regulatory agencies and user groups should be sought via Regional Advisory Groups.

We suggest that the Regional Marine Research Oversight Board become a National Marine Research Advisory Board, staffed either by NOAA or NSF. The National Advisory Board should:

- approve initial regional program proposals;
- comment upon biennial regional research proposals, given criteria in the respective regional program plans, goals of the enabling legislation and peer reviews;
- facilitate coordination between research regions;
- aid in inventorying federally-funded research in the various regions and facilitate communication and coordination between federal agencies and Regional Boards; and
- include the State Department in order to facilitate international coordination.

The Regional Marine Research Boards should be the primary decision makers as well as planners. Peer review and proposal selection should be implemented largely at this level, with the National Board serving as an oversight and advisory body. The Regional Boards should:

- develop regional research plans;
- solicit research proposals;
- solicit peer reviews for all proposals, making use of acknowledged leaders in the appropriate fields;
- facilitate proposal review by the regional Research Advisory Groups;
- make the final selection of component proposals for the biennial research proposal package based on relevance to the regional plan, inputs from the Research Advisory Group, and merit reviews;
- make reports to the public and scientific community regarding research results, and
- provide regular reports (triennial?) to the National Advisory Board for compilation of a national report to Congress.

PEER REVIEW

Scientific and technical soundness and merit should be an essential characteristic of any research or monitoring project supported by the program. Unsound, mediocre and/or duplicative research, at best, is an inefficient use of limited resources and, at worst, can lead scientists, managers, and policy makers down wrong and costly paths. Consequently, merit review, including review by scientific peers, of research and monitoring proposals is imperative and scientific and technical soundness should an essential criterion. Peer review is a distinguishing strength of American science. Only those proposals which are judged to have high scientific or technical merit by peers, including reviewers from outside of the region, should be supported based on consideration of other criteria such as:

1) views and comments of cognizant organizations and agencies pursuant to Section 504(e)(2)(c) of S.587;

2) views and comments of the Research Advisory Group; and

3) the extent to which the proposed project is consistent with the goals, objectives, and priorities identified in the regional research plan.

CONCLUSION

We believe that the Nation needs an expanded effort in marine research in the coastal ocean in order to more effectively deal with the environmental and resource issues of today and the future. We also believe that the development of research goals and the implementation of research programs on a regional basis is warranted both because of the growing scale of our environmental and resource management problems and for reasons of efficiency and equity. The marine research community stands ready to work with Congress in the development of appropriate mechanisms to reach this end.

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July 3, 1989

TESTIMONY

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

SUBCOMMITTEE ON SUPERFUND, OCEAN, AND WATER PROTECTION
and
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION

on

LEGISLATION TO EXPAND AND STRENGTHEN PROGRAMS FOR RESEARCH
AND PROTECTION OF MARINE AND COASTAL WATERS

by

M.A. DAVIDSON, PRESIDENT, SEA GRANT ASSOCIATION
JULY 25, 1989

Thank you, Mr. Chairman, for the opportunity to provide testimony on the timely and important issues of the expansion and strengthening of programs for research and protection of marine and coastal waters. I am Margaret A. Davidson, Executive Director of the South Carolina Sea Grant Consortium and also the President of the Sea Grant Association.

The Sea Grant Association consists of Colleges, Universities, Research Centers, and Consortia all dedicated to enhancing the nation's capability to understand, use and manage our coastal and marine resources.

The National Sea Grant College Program has evolved over the past decade to become the nation's leading coastal ocean program. Working through a network of 29 regional programs, Sea Grant involves 270 colleges and universities throughout the nation in addressing important coastal and marine issues. Sea Grant connects academic marine science with state and federal agencies and coastal marine industries to sustain and advance the economic and social well being of the nation through focused research, education, and technology transfer programs.

Our nation's water quality is declining, populations are burgeoning, sea level is rising, habitats are deteriorating, and fish and shellfish are being contaminated. We are faced with responding to these and a host of interrelated issues. These environmental dilemmas are the inadvertent by-products of a scientifically sophisticated and technologically advanced society.

After two decades of striving to couple science with regulation, we find ourselves at a point where we must develop innovative strategies that provide us with a better understanding of ecosystem-wide processes, man-induced changes and responses. We must also expand and improve the pool of scientific and engineering talent necessary to identify and solve environmental problems, and step up technology transfer. This is where Sea Grant can play an important role, as a national network based on multidisciplinary approaches to marine and coastal problem-solving through a multilevel strategy that combines research, education and technology transfer.

We applaud the members of the Environmental and Public Works Committee for their efforts to address these critical needs. We enthusiastically welcome your bills which address coastal ocean and marine resources. We agree with the need for more effective regional planning and coordination; better data collection, data analysis and usage through comprehensive research, monitoring, and assessment; strengthened and more comprehensive approaches to coastal and marine water quality control; and broadened programs for technology transfer and education.

Recently, representatives of the Sea Grant Association have been meeting on an ad hoc basis with representatives of various scientific organizations. We originally met to discuss S. 587 and S. 588; however, discussions ranged broadly over both those bills and some of the related issues embodied in S. 1178 and S. 1179. Among the overriding issues were concern about the limited amount of monies to support these critical needs, skepticism about sustained attention to the needs and the lack of carefully coordinated and synoptic efforts among relevant federal agencies.

With regard to S. 587, we are in general agreement with the community statement submitted to you by Dr. Don Boesch on behalf of the regional marine research forum participants. However, the members of the Association believe that a successful program requires the inclusion of the Great Lakes as a designated region as these inland seas are threatened by the same pressures affecting our salt water coasts. Information developed by university scientists working in the Great Lakes can provide valuable insights on how to deal with our complex coastal estuaries.

We strongly urge a closer and actual coordination between E.P.A. and N.O.A.A. and other relevant agencies. Each has an important role to play: failure to orchestrate those roles will only foster further inefficiencies. I must stress that this coordination will be required regardless of which entity is the lead agency for any specific function. And this is a matter which requires more than the negotiation and conclusion of Memoranda of Understanding; it requires a commitment from the agencies, and it requires leadership at all levels of the bureaucracies-down to and including their various state cooperators.

We are heartened by the new and innovative funding source detailed in S. 588. Absent new approaches to funding, our experience with several federal agencies has shown that "new initiatives" and "new programs" are but a death knell for an agency that then begins to starve existing programs in order to provide resources to the new effort. For example, N.O.A.A. has a new and approved "coastal ocean initiative." However, it has and will continue to be constrained in developing an effective effort by a lack of financial resources which, in turn, may reflect a lack of focused attention on these important and timely issues.

And this problem is not N.O.A.A.´s alone. The recent report to E.P.A. from its Science Advisory Board[1] pointed out that the agency´s research efforts have, in the past, been driven by short-term approaches and urged a broader vision. Absent continued increases in their budget, the agency will be hampered in carrying out the report´s recommendations and this Committee´s desires. The Association is particularly interested in working with E.P.A. to carry out its new mandates for involvement in both education and technology transfer.

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[1] Future Risk: Research Strategies for the 1990s. Report of the Research Strategies Committee, Science Advisory Board, U.S. Environmental Protection Agency, September 1988.

Contrast these agencies' efforts to expand their vision while hobbled to limited budgets with that of the National Science Foundation. Not surprisingly, the academic community is very comfortable with the thought of the Foundation playing a stronger role in a heightened emphasis on this nation's coastal ocean. And their budget numbers have encouraged augmentation of their vision and role in coastal ocean research. A major reservation regarding NSF's role in your initiatives is their limited experience in technology transfer, the coupling of research to the needs of society at large. Indeed, until quite recently, their main experience in that arena was acquired while the Sea Grant program was still based at the National Science Foundation.

The bills being considered by the Committee are ambitious and far-reaching; they literally cover the waterfront. As broad remarks, we encourage you not to overlook the integral importance of active education and technology transfer components: these permit the successful implementation of the goals toward which research and monitoring programs are directed. The approaches embodied in S.1179 are similar to those tested and proved through the experiences of the Sea Grant program and its Marine Advisory Services. These extension and education professionals are involved in the delivery of information on coastal land management, habitat, and water quality.

The Association is keenly interested in working with you to implement legislative and agency initiatives that will address the critical needs facing us in our coastal areas. We have the scientific talent through our national network; we have the proven track record in coastal research, education, and technology transfer; and we have also given much thought to these critical needs, as evidenced by our proposed national Coastal Change initiative.

Through a carefully targeted initiative aimed at developing critical manpower, transferring technology and initiating new research, the main focus is initially on improving water quality, with associated efforts in coastal processes and technology applications. Our Coastal Change Initiative encompasses programs to train students and encourage scientists to focus on those areas that badly need new talent. We propose research directed at the role of sediments and man's impact on natural systems. More importantly, we plan to make sure the research results get to the real people who need it, through a national network of water quality agents and coastal processes specialists. We have a reputation for innovative research and training efforts and we have a proven network of marine education and technology transfer professionals. As you know, these are interrelated issues, and should be addressed in an integrated fashion that permits the efficient use of scarce funds where the potential for benefits is the greatest.

We have the experiences and skills that can assist you in your goal of fostering greater cooperation between agencies and better public understanding of these issues that transcend government agencies and geopolitical boundaries. We look forward to working with the Committee to focus and strengthen efforts directed towards our vital coastal ocean.

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STATEMENT OF

THE HONORABLE JOHN BULLARD

MAYOR OF NEW BEDFORD, MASSACHUSETTS

on behalf of

THE NATIONAL LEAGUE OF CITIES

on

PROTECTION OF MARINE AND COASTAL WATERS

and

MUNICIPAL COMBINED SEWER OVERFLOWS

before the

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION

and the

SUBCOMMITTEE ON SUPERFUND, OCEAN AND WATER PROTECTION

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

July 25, 1989

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Mr. Chairman, members of the committee: I am John Bullard, Mayor of the All-America City of New Bedford, Massachusetts. I am here today to testify on behalf of the National League of Cities and the 16,000 cities and towns across the nation we represent on the problems of combined sewer overflows.

The National League of Cities is currently developing a more comprehensive policy on combined sewer overflows beyond the resolution that was adopted at our most recent annual meeting last December (Copy attached). Clearly, we have substantial interests in and significant concerns about federal actions and mandates on these CSOs.

We are pleased to see Congress re-examine the problems of combined sewer overflows because it provides an opportunity to review whether the benefits of a mandatory program to eliminate CSOs bear a rational relationship to the costs involved in such a program. As some of you may recall, in 1972, the EPA administrator opposed including CSOs in the construction grants program because **it would be too expensive for the federal government!**

The unique nature of CSOs has never been formally recognized by Congress, by EPA or by state regulatory agencies. Accordingly, there is great concern by many municipalities with CSOs that current new initiatives will attempt to deal with CSOs in the same manner as other point source discharges.

Let me be clear at the outset, in the most emphatic way possible, that the elected officials in the nation's cities and towns support initiatives and efforts to clean up environmental problems and to make investments in preventing further pollution. It isn't necessary to bludgeon municipal officials into caring about the ambience of our communities. Its easy to sit in Southwest Washington, D.C. or perhaps even up here on Capitol Hill and think the environment should be better than it is. But businesses don't locate and families don't buy homes in communities with significant environmental problems. More importantly, we live in our communities and so do our families. Our stake is not from a distance.

But our support is tempered by reality. We are rapidly approaching a critical overload. Just in the last two years, municipalities across the nation have been confronted with the following federal environmental mandates. In all but one case these mandates must be funded solely out of local revenue sources:

- o proposed new standards for municipal solid waste landfills -- $887 million* annually;
- o regulations to reduce lead in drinking water -- $1.2 billion;
- o implementation of surface drinking water treatment requirements -- $3 billion in capital costs; $500 million in annual operating costs;
- o construction of municipal secondary treatment plants to serve current population needs -- $69 billion; (federal contribution of less than $15 billion)
- o replacement of existing municipally owned underground storage tanks -- $2.3 billion.

Mr. Chairman, these four programs alone will require municipalities to spend close to $62 billion! Furthermore, this $62 billion does not include:

- o implementation of separate storm water sewer management program -- cost unknown;
- o implementation of EPA's CSO guidance -- cost unknown; (EPA's cost estimate for 320 CSO systems with plans is $16.4 billion; but there are 1200 cities with CSOs);

* Source of cost estimates: U.S. EPA.

- o clean up of municipal sites on the National Priorities List -- cost unknown;
- o implementation of SARA Title III -- cost unknown;
- o complying with financial assurance requirements for underground storage tanks, a program from which the federal and state governments are exempt -- cost unknown.

It appears to us that the federal government has poorly managed its own fiscal affairs and cannot seem to put them back in order. What is happening now appears to us to be an attempt to continue business as usual, merely shifting the financing responsibility to other levels of government. The end result will be that all our fiscal houses will be in total disarray.

We hear much talk about "partnerships." If I may paraphrase from Gerald Ford's first State of the Union message, "the state of our intergovernmental partnership is not good." Our federal "partner" appears to make endless decisions on something other than a coordinated basis about what needs to be done and then assigns the "doing" to other levels of government with little concern about how or with what resources. If indeed the critical overload topples some of the nation's cities or towns into bankruptcy, none of these environmental objectives will be attained.

I would note that the federal government is about to obligate the American taxpayer to spending over $250 billion to bail out failed savings and loan institutions. That is perhaps important and necessary to keep the savings and loan industry from dire economic consequences. What we don't understand is why protecting our environment doesn't have a similar priority at the federal level. If our water, air and land can no longer sustain a reasonable quality of life, what difference does it make if we have sound savings and loan institutions?

We know these are difficult times, but we cannot be paralyzed from acting. Cities are investing in a clean environment. Last year New Bedford spent $10.6 million of its $122 million budget on clean water. States are investing in a clean environment. Today, Governor Dukakis, despite Massachusetts well known financial difficulties, is signing a $1.5 billion bond program for clean water. The federal government alone is reducing its commitment to the environment. That unfairness is behind the breakdown in our partnership.

We have no sense that there are federal priorities among the variety of environmental problems we are required to address. While conceding that it will be no easy task, we must begin to prioritize our environmental protection agenda. The federal government says it can no longer afford to help finance its mandates; state and local governments cannot afford to pick up the tab alone. When everything is a priority, nothing is a priority. We must, preferably working together, arrange our environmental problem-solving agenda into something more orderly than what we have now if we are serious about environmental protection.

We estimate that dealing adequately with the nation's 1,200 municipal CSO systems will cost these cities and towns between $50 and $100 billion. Since it is mostly the older cities -- and by and large, those with very limited access to new revenues -- that have combined sewers, we believe the financial burden of controlling CSOs will be beyond the ability of many of these cities to carry solely on their own.

It would seem to make sense to us to use a technology-based approach determined on a case-by-case basis using best professional judgement weighing costs and benefits. The cost-benefit analysis should carefully consider the great cost of CSO control, the intermittent and dilute nature of CSO discharges, the extremely large rate of the discharges, and the often remote locations of CSO outfalls against measurable benefits.

Technology-based requirements should not be assumed to involve end-of-the-pipe technology such as retention followed by conventional wastewater treatment. The technology-based requirements should provide for a wide variety of control techniques such as infiltration/inflow control, street sweeping, and conveyance away from sensitive environmental areas. Costly improvements, such as partial or total sewer separation, will have to be phased in over time.

CSO control requires a flexible approach. Rather than defining the technology-based requirements as an ultimate level of control that must be achieved by a specific deadline, municipalities should be deemed in compliance once control plans and implementation schedules are in place, assuming the controls are appropriate and the implementation schedule adhered to.

It is our hope that any CSO strategy will emphasize and target all contributors to marine pollution, not just jurisdictions closest to the estuary.

We also strongly advocate that deadlines be realistic. More often than not, we at the municipal level perceive that we are being set up to fail. Costs, the manifold environmental mandates facing us, continual and increasing constraints by federal tax code revisions on our ability to finance these programs with local revenue sources, must all be taken into account in establishing deadlines for compliance with new mandates.

Moreover, as we said in earlier testimony before this subcommittee, we would suggest that it is important for Congress to consider new requirements only in the context of the federal government's willingness to make and honor long-term commitments. Section 201(n)(2) of the Clean Water Act authorizes $200 million annually beginning in 1983 for marine CSOs. To date, a total of $60 million has been appropriated for this program; a total of $92.51 million has been spent on the program since 1984; the difference of $32.51 million coming from the construction grants program. This as opposed to a total authorized amount since 1984 of $1.2 billion.

Thank you for the opportunity to present my views and those of the National League of Cities on this issue. I would be happy to answer any questions you may have.

RESOLUTION #5

COMBINED SEWER OVERFLOW CONTROLS

WHEREAS, many cities in the United States have sewer systems which include sewers that convey combined sanitary sewerage and stormwater and which experience combined sewer overflows of untreated sanitary sewage and stormwater during and immediately following precipitation events; and

WHEREAS, combined sewer overflows are a long-standing condition of many older cities; and

WHEREAS, design of combined sewer overflow controls can not be generalized, but is complex and must be based on-site specific studies of the sewer system, the receiving waters and other factors; and

WHEREAS, cities with combined sewer overflow systems, the states and the Nation will benefit from improved sewer overflow controls; and

WHEREAS, the cost of implementing combined sewer overflow controls is beyond the financial capabilities of most cities that have combined sewer overflow systems; and

WHEREAS, the U.S. Environmental Protection Agency is considering adoption of a national combined sewer overflow control policy; and

WHEREAS, some cities have virtually exhausted their local financial resources addressing their CSO's and other wastewater-related problems.

NOW, THEREFORE, BE IT RESOLVED that the National League of Cities resolves that they shall support and aggressively seek Federal grants and other funding to help underwrite the cost of combined sewer overflow controls; and

BE IT FURTHER RESOLVED that the United States Environmental Protection Agency should implement a national combined sewer overflow control policy and strategy that stresses cost-effectiveness and flexibility, and recognizes, among other things, the site-specific nature of proper combined sewer overflow controls, and the financial incapability of many cities to undertake such control without substantial federal grant funding and other outside funding; and

BE IT FURTHER RESOLVED the U.S. Congress should adopt legislation that encourages localities to address their CSO problems within the limits of their financial resources and recognizes that localities can not undertake CSO controls which are beyond the limits of their financial resources until such time as sufficient federal grant funding is made available. Local funds expended on CSO control should be credited toward the local share required as a condition to federal funding.

Approved by the Membership of the National League of Cities
Annual Business Meeting o December 7, 1988 o Boston

City of New Bedford
OFFICE OF THE MAYOR

John K. Bullard, Mayor

October 20, 1989

Senator Max Baucus
Chairman, Subcommittee on Environmental Protection
Committee on Environment and Public Works
U.S. Senate
Washington, D.C. 20510-6175

Dear Senator Baucus:

Enclosed are responses to the questions I received from you on September 25.

I wish to again thank the Committee for the opportunity to testify on the severity of problems that combined sewer overflows (CSOs) cause to the marine environment. Marine CSOs are a serious and significant polluter of waters along the East coast, and a problem cities are now attempting to remedy.

Unfortunately, the costs of the facilities required to eliminate or abate CSOs are extremely high. Regardless of the high priority environmental improvement is given, cities cannot fund these improvements alone. The Committee's interest in this important issue is encouraging.

If I may be of further assistance, please contact my office.

Sincerely,

JOHN K. BULLARD
MAYOR

JKB:lsb

133 William Street • New Bedford, Massachusetts 02740 • (508) 999-2931

Response to Questions on Combined Sewer Overflows

Funding

Capital costs of marine CSO abatement facilities are extremely high. For example, recent cost estimates for facilities which will allow the City of New Bedford to come into compliance with Massachusetts policy, and to significantly improve marine water quality, total $126 million. This cost is in addition to $200 million being spent to expand and upgrade the City's wastewater treatment plant, a prerequisite for the CSO storage/pumpback facilities.

The magnitude of these costs is a source of frustration for cities like New Bedford which desire to improve the quality of their valuable coastal waters. In fact, in my city, the costs cannot be absorbed at once but improvements must be phased over a 27-year period. Even at that, household sewer rates will quadruple and these sources of pollution will persist for an additional 10 to 27 years.

The bill filed by Senators Baucus and Mitchell providing for CSO remediation to be eligible for the revolving loan program is a positive measure. If it were possible, a combination of grants and loans would be an even better means of addressing the burden of severe costs of CSO abatement in cities. The revolving loan program, however, would be an excellent measure and could be expected to directly result in increased abatement of marine combined sewer overflows.

Control Standards for CSOs

1. There is no single standard of CSO control that should be required by EPA and the states.

The level of control of CSOs is related to three parameters:

frequency
volume
pollutant removal (control technology)

In Massachusetts, interim policy on CSOs relates CSO abatement to the water quality standards of the waters receiving CSO discharges. The policy requires that water quality standards are met 99% of the time. However, this standard is problematic in areas where non-combined storm drains are an equally significant source of pollution.

Generally, the level of control is determined with a minimum acceptable level, and/or a cost-benefit analysis in dollars per unit abatement for levels above the minimum.

Another consideration is the significance of CSOs as polluters in comparison to other sources such as treatment plant outfalls and industrial discharges. In many cities, CSOs are the most signficant polluter; these cities should provide a greater level of treatment than cities where CSOs are a minor polluter relative to other sources. That is, funding and energy should be directed to the most important sources - often but not always CSOs, to provide the greatest environmental benefit.

Thus, the level of CSO control required by EPA and the states cannot be a simple standard, but should be appropriate for the specific project, given the objectives for the marine waters, any other sources of pollution, and the costs and benefits of facilities.

2. The answer to the question is that any level of control will result in an improvement of floatables and aesthetics in marine waters. The required level of control may or may not have a significant improvement in water quality, depending on the presence of other pollution sources. Overall, however, CSOs are a significant source of pollution and must be remediated if the quality of our harbors and bays is to improve.

Floatables and oil and grease are parameters most importantly affecting the aesthetic value of marine waters. All means of CSO abatement will remove a high percentage of floatables and oil and grease. (Sewer separation, however, is the exception as it may not reduce floatables signficiantly.) The degree to which there will still be aesthetic problems in the waters depends on the frequency of the storm events and the significance of other pollution sources.

The degree of improvement of other water quality parameters depends not just on the CSO control standards but on the significance of other polluters, the nature of the storm events, and the abatement technology utilized.

3. Total elimination of CSOs is often technically difficult and extremely costly to acheive. However, CSO control for less than total elimination represents a significant benefit to waters into which the CSOs discharge.

CSO control for a 3-month storm, for example, will mean that CSOs discharge for an average of four days per year. If industrial facilities are connected into combined sewers, a quantity of untreated industrial wastewater, as part of the combined wastewater, will be discharged during rainfalls more extreme than the 3-month storm event. The quantity of flow discharged would be only the amount of flow over and above the design storm, and is very small in comparison to no control.

As a specific example, in New Bedford, CSO control at the 3-month level will reduce annual CSO volume by approximately 90%. In another portion of the project, CSO control at the 12-month level is required but may enable valuable shellfish beds to be reopened. Even at the 12-month level, discharges would not be eliminated but would occur at an average of less than one discharge per year.

Therefore, industrial wastewaters will continue to enter marine waters untreated whenever it rains unless total elimination is acheived, however, the amount is small by comparison to the total amount of the discharge. Again, many factors must be considered (most specifically the cost and environmental benefit) prior to embarking on total elimination.

Statement of

JOHN J. TERPSTRA
Vice-Chairman, U.S. Delegation

The American Association of Port Authorities

on

"The Marine Protection Act of 1989"

and

"The Comprehensive Ocean Assessment and Strategy Act of 1989"

Before the

Subcommittee on Superfund, Ocean and Water Protection

and

Subcommittee on Environment Protection

of the

Committee on Environment and Public Works

United States Senate

July 25, 1989

My name is John J. Terpstra. I am Executive Director of the Port of Tacoma, Washington and the Vice Chairman of the American Association of Port Authorities. My testimony is given today on behalf of AAPA.

Founded in 1912, AAPA represents virtually all public seaport authorities and agencies in the United States. AAPA members are mandated by law to serve public purposes, primarily the facilitation of waterborne commerce and the consequent generation of local and regional economic growth. As public agencies, AAPA members share the public's interest in a clean environment while serving our country's international trade and national security objectives.

Mr. Chairman, the public port industry commends you for your commitment to reducing pollution and to restoring the health of our coastal environment. Much remains to be done. According to the Environmental Protection Agency (EPA), most of the pollutants still entering our waterways are doing so legally. These pollutants adhere to sediments which eventually find their way into our harbors. As a result, public port authorities are put in the position of having to clean up the residues of others, often at tremendous expense. Clearly, seaports will be one of the many beneficiaries of a cleaner marine environment.

Ninety-five percent of the world's traded goods are transported in oceangoing vessels which require navigational access to and from U.S. markets. Because of natural siltation processes, there is really no alternative to dredging if port operations are to continue and if harbors are to be improved to handle the increased trade volumes expected in the coming decades. Dredging is indispensable to maintaining our international transportation infrastructure.

Although less than five percent of all dredged material is seriously polluted, contaminated sediments are more likely to be found near the ocean terminal berths where port authorities must dredge in order to gain access to the federal navigation channel. Ports are often located in, or near, highly industrial urban centers and are subject to runoff and discharges from roads, freeways, residential development, as well as commercial and industrial sources. Moving contaminated sediments constitutes a very serious management problem for the public port industry. We are, therefore, directly impacted by any law or regulation affecting the relocation of bottom sediments in our navigable waters. While we support the primary objectives of the bills we are discussing today -- to reduce the sources of pollution into our coastal waters -- the bills also threaten to jeopardize the progress we have made with respect to the management of contaminated sediments, both from an environmental and economic standpoint.

Mr. Chairman, we agree that more consistency is needed around the country in contaminated dredged material regulation. Enormous resources are expended by public port authorities and the government to characterize dredged sediments and to develop environmentally sound disposal solutions. The cost of regulatory compliance has skyrocketed -- in some instances, testing and analytical work has become more expensive than the dredging itself. The quest for more data, and the attempt to satisfy the various federal, state and local agency demands, increases the complexity of the process and sometimes results in confusion. (And regardless of the additional data, the alternatives for disposal remain limited. Often, the only decision that must be made is whether to confine the sediments or not, or whether to "cap" sediments underwater with clean material.) The public port industry is counting on the ongoing EPA regulatory revisions to promote the needed consistency and reduce uncertainty.

In contrast to the slow, but steady, progress which has been made towards an environmentally, economically, and scientifically sound decision matrix for dredged material management, S.1178 would give the states authority to develop their own sediment standards, which would exacerbate inconsistencies and likely increase the cost of port operations without commensurate benefits to the environment. It might also put some ports at a competitive disadvantage and contribute to our Nation's difficulty competing in world markets. Furthermore, it has potentially dramatic cost implications for the federal maintenance dredging program.

Numerical Sediment Criteria

Using numerical sediment criteria to make disposal decisions may be a way to achieve superficial program consistency, at least within the same state, but it would come at the expense of a sound waste management policy. It also would preempt the ongoing regulatory reform effort as well as the last twenty years of internationally recognized scientific dredged material research, which is manifest in the London Dumping Convention. Application of numerical standards in some states has led to simplistic determinations that are only tenuously related to biological impacts, have found naturally occurring concentrations of a substance to constitute "contamination," and are extremely limited in their scientific validity over wide areas. However, numerical sediment criteria might be put to good use in site monitoring, research and for ecological assessment purposes, but their use in actually managing dredged material can lead to unwise environmental and waste management decisions.

As far as S.1179 is concerned, it is unclear to us how the proposed criteria would be used in a management context (e.g., are they similar to the state water quality certification authority?). However, S.1178 establishes a new regulatory regime and overturns long-standing agency relationships and management protocols. The use of numerical sediment criteria for decision making purposes has been studied by EPA's Science Advisory Board and the Marine Board of the National Academy of Sciences as well as by international experts at the London Dumping Convention. All of these scientific bodies have serious reservations about the use of the sediment criteria systems that have been proposed to date.

These reservations concerning numerical sediment criteria standards exist because of the inherent difficulty in attempting to assess biological impacts in the widely varying marine environments from chemical data alone. An arbitrary level of contamination in one soil type does not have the same biological effect as the same level of contamination in another soil type. Importantly, both federal and nonfederal research has demonstrated that potential toxicants are quite often chemically and physically bonded to the sediments, thus precluding their availability to organisms in the food chain.

Thus far, the only proven indicator of whether sediments may be toxic are biological or "effects-based" tests. Organisms must be exposed to the soil in question to measure mortality and bioaccumulation. There are simply too many variables involved to derive toxicity for an array of environments through a calculated cause and effect relationship. In addition, the safe handling of dredged material depends on many factors other than sampling results, including actual dredging practices.

As mentioned, the larger problem with criteria, beyond their scientific validity, is how they are used in the decision-making process. For example, PCBs are legally hazardous (under TSCA) at 50 parts per million (ppm). Why should dredged material be managed differently at 50 ppm PCBs than at 49 ppm? This illustrates how the use of a numerical sediment criteria to make managerial decisions about underwater soils could lead to decisions which are less protective of the environment than under the current system. A move to simplistic "pass-fail" numerical standards results in an emphasis on data that tells us little about cause and effect within the ecosystem, the magnitude of potential impacts, and contributes little to what is needed to handle materials safely.

Another problem with numerical sediment criteria concerns their potential misuse in the selection of dredged material disposal sites, the overriding navigation issue for the Corps, EPA, states and the public port industry. The selection of the best dredged material disposal site is truly an intergovernmental process. As the lead regulatory agency, the Corps attempts to "weigh and balance" both land-based and water-based disposal alternatives on an equal basis without prematurely ruling out any management alternative. However, because state and federal resource agencies are often mandated to protect one particular medium, be it water, land, fish habitat, waterfowl habitat, or wetland resources, determining which disposal alternative is both environmentally acceptable and economically viable is a delicate balancing act. Where numerical sediment standards have been employed, they have been used to eliminate one disposal option without regard to the environmental impacts of the alternative. Likewise, under S.1178, sediments that fail a "pass-fail" test can not be relocated to a designated "priority estuary," regardless of whether an environmental risk exists. Again, this may lead to poor decisions from a resource conservation perspective.

The dredged material regulatory procedures that exist under both the Clean Water Act and the Ocean Dumping Act have taken years to develop and are currently being revised to ensure their state-of-the-art status. The revision is based on years of research, practical experience and intergovernmental deliberations. Importantly, the revised testing manual for sediments to be disposed in the ocean, which should be released this fall, will continue to use "effects-based" tests that directly assess the toxicity of the sediment as part of the decision process. Unlike numerical criteria, these testing protocols have been proven effective and are scientifically defensible. The decision-making process under the EPA protocols may be somewhat more difficult to understand than a "pass-fail" number system, but it undoubtedly provides a superior regulatory framework.

Management of the Dredged Material Program

Clearly, the federal government's overall management of the dredging program -- both the Corps of Engineers' and EPA's -- can be improved. For example, resources are currently lacking for long-term dredged material disposal planning, for disposal site designation, and for site monitoring projects. AAPA welcomes the opportunity to work with you in these and other areas to help improve the program.

Mr. Chairman, although we are not aware of instances where disposal decisions are producing environmentally unacceptable consequences, especially in light of the alternatives available, the management of dredged material may need more thorough and formal congressional attention. Furthermore, we have the ability today to identify situations where contaminated sediments are being mismanaged, and if so, correct them without delay. However, before overturning our regulatory system, which would result from the passage of S.1178, we suggest starting with the approach advocated by Senator Moynihan in S.1210. His bill would provide for a comprehensive assessment of the contaminated sediment problem.

To date, a demonstrated need for the proposals in S.1178 to change the legal relationships and regulatory approach now employed in the field has not been established. EPA already has the ultimate decision making authority under both the Clean Water Act and the Ocean Dumping Act to prevent any disposal decision made by the Corps of Engineers. And despite the problem of retaining technical experts in some districts, the Corps has far greater scientific as well as managerial expertise in handling contaminated sediments than any other federal agency. In most cases, the Corps should be commended for satisfying all the tremendously varied regulatory and resource agency demands while still controlling the cost to the taxpayers.

Cost Sharing Reform

Mr. Chairman, I would like to take this opportunity before this committee to bring up a related issue under your jurisdiction. Under the cost sharing provisions for new construction projects, land-based disposal sites are now the sole responsibility of the nonfederal sponsor (the cost can be deducted from the ten percent repayment requirement), but water-based sites remain primarily the responsibility of the federal government. This artificial dichotomy is not good policy. Because the disposal site is an integral and fundamental part of any navigation project, any and all disposal alternatives should be part of the total project cost and cost shared in accordance with the Water

Resources Development Act of 1986 (Section 101, P.L.99-662). This change would help ensure that all disposal options are considered on an equal basis, the overall philosophy guiding decision-making.

Conclusion

In conclusion, sediments transported into the harbor by natural processes, where they fall out of the water column, sometimes contain contaminants. These sediments must be periodically dredged if the port is to continue to function. As the entities that must dredge in order to do business, public port authorities are left with the job of moving these residues. For this reason, AAPA members have a large stake in your efforts to end both point and nonpoint source pollution of our waterways and to reduce unnatural soil erosion. In our opinion, this is where scarce taxpayer resources should be concentrated. With much needed long-term planning and consistent application of environmental safeguards currently being utilized and refined, the detrimental impacts of all types of dredged material relocation can be rendered negligible. Thank you.

Statement
of the
Association of Metropolitan Sewerage Agencies
before the
Senate Subcommittees on Environmental Protection and Superfund, Ocean and Water Protection
July 25, 1989

Mr. Chairman and members of the Subcommittees, I am John Lampe, Superintendent of Water Quality for the Municipality of Metropolitan Seattle. Seattle Metro is a member of the Association of Metropolitan Sewerage Agencies. AMSA is a national organization of more than one hundred of the nation's larger wastewater treatment agencies serving nearly 90 million citizens across the country.

AMSA is pleased to have this opportunity to testify before the Subcommittees and provide our views on pending legislation to protect the nation's coastal and marine resources. As municipal and regional public agencies, AMSA's members for more than a generation have successfully reduced pollution of the nation's waters through significant advances in wastewater treatment. I assure you, Mr. Chairman, that our membership remains fully committed to tackling the issues identified in the legislation before us today.

AMSA recognizes the need for a more comprehensive national marine and coastal waters policy. Last year we established a new Coastal and Marine Waters Committee to develop and evaluate new initiatives and policies to respond more effectively to the concerns and problems now before the Subcommittees.

Mr. Chairman, let me begin my remarks by underscoring basic issues that AMSA believes should be addressed by the Subcommittees as you consider new legislation to protect our nation's marine waters.

Clear Objectives and Realistic Goals Needed

First, the federal government must continue to exercise its leadership in developing clear and concise objectives that all of us can embrace and pursue at each level of government to address the real problems of pollution and the potential for degradation of marine waters. To this end, the Congress and the Administration must be actively involved in building national consensus on these issues. It is important that your efforts foster a climate of support for programs, investments and intergovernmental cooperation that is needed to improve and protect the condition of our marine waters.

More Funding and Resources

With the enactment of the landmark Clean Water Act in 1972, our members and others look specifically to the U.S. EPA to exercise leadership, specifically by providing guidance and detailed technical assistance, in combating pollution affecting our coastal waters. Achievement of many of the objectives set forth in the legislation now before the Subcommittees will require increased resources to support these efforts. The Agency's work program in the wake of the 1987 Act amedments is already substantial. The new issues and expanded requirements contemplated in legislation before the Subcommittees will add substantially more. It is clear that if we are to successfullly respond to any new initiatives enacted as a result of this process, the Congress must first be prepared to ensure that the necessary research, technical assistance, and staffing matches the tasks that you have set out for the country. The pending legislation clearly commits the federal government to new investments in support of its more active and direct involvement in improving our marine waters. The success of these initiatives will ultimately be tied to future Congressional deliberations on subsequent funding for EPA and others that will be engaged in implementing statutorally-prescribed programs and initiatives.

Good Science Needed

If our agencies and others at the local level are to successfully embark on expanded programs to address new marine and coastal program requirements, we must have the benefit of a solid foundation built by our federal partner -- new science, new technologies, new standards, expanded product bans, expanded technical assistance and information capabilities -- to help pave the way for local efforts necessary for improving the condition of the nation's coastal waters.

Review of Record to Date to Shows Success of Existing Programs

Finally, AMSA would encourage the Subcommittees to more fully review ongoing Clean Water Act programs and initiatives to clearly identify where existing programs are failing to respond to specific concerns of Subcommittee members. Our member agencies strongly believe that they have made great advances in wastewater treatment, resulting in substantial reductions in loadings and pollutants into the environment. It takes some time for EPA and for those of us on the delivery end to understand and gear-up to implement new legislation of the type now under consideration. We are concerned that progress on locally-adopted plans to achieve similar objectives could be hindered by the need to adjust to the specifics of new legislation. This is not to say that more should not be done, but the record needs to reflect that the substantial existing investments by local agencies and the federal government have improved conditions and have arrested the decline of marine waters in many areas of the country, especially for pollutants attibutable to point sources (particularly wastewater treatment discharges).

Mr. Chairman, let me now review specifically several issue areas that are addressed in the legislation before us, specifically focusing on S. 1178 and S. 1179.

Our members have made significant strides in improving the quality of wastewater discharges. I have provided with my statement one well-documented example of a successful local program. We will provide other such examples for the Subcommittees's review, reflecting both the diversity of environmental problems affecting our coastal and marine waters and the range of partnership responses to these problems. Let me describe our efforts in the Puget Sound to underscore the point and also to provide some context for the specific requirements set forth in the legislation before us.

Seattle and the rest of the Puget Sound region have been diligent in protection of what we consider to be a local treasure. We began to focus on toxics in the mid 1970's and have developed a substantial body of information concerning the sources, fate and effects of toxics in local fresh and marine waters.

A management plan for Puget Sound is in place and is being aggressively implemented by state and local agencies. This plan meets the requirements of the existing Clean Water Act. Likewise, under the Estuary program, a triumverate comprised of EPA, the Washington State Department of Ecology, and the Puget Sound Water Quality Authority serves as the management conference for Puget Sound.

An element of the Puget Sound Management Plan is the development of sediment standards in order to protect both human health and biota from chemical damage. The state is moving rapidly to develop these standards. We have learned from this process that the development of standards is an extremely complex, difficult and time-consuming task. Both the regulatory and the scientific communities are wrestling with the methodologies to be employed and how to establish standards that take into consideration the divergence of beneficial uses of the Sound. This process will take time, but we are committed to developing standards which are well-founded and will serve us for years.

Thirty years of experience in implementing conventional pollution control strategies, and a five year, $7 million study of toxics in Puget Sound, have taught us much: the key to non-point discharges is source control; Metro's aggressive industrial pretreatment program has resulted in reductions of heavy metal contributions ranging from 43 to 82 percent over the last eight years; POTW discharges to Puget Sound account for less than 4% of the metals contributions; CSOs account for less than 0.1%; Puget Sound sediments are less contaminated with PAHs, PCBs, Lead and other contaminants than in the past (there is a clear and substantial decline in pollutant concentrations).

This information provides a very important basis for the local management decisions we make and the remarkable community support we enjoy.

As you can see, in the Puget Sound area we have been actively involved in a comprehensive approach to the management and improvement of our estuary. Many other agencies have been similarly active. AMSA strongly supports legislation that will provide incentives and technical resources in support of such comprehensive reviews and plans for our marine waters. It is our recommendation that the focus of the management conferences and other regional management efforts be used as a machanism to build political and technical consensus on options and strategies available to a region or locality to make the necessary investments in facilities and programs to improve coastal waters. This approach also encourages active community involvement in identifying problems and determining solutions. This process would also provide a structure for all levels of government -- federal, state and local -- to develop strategies and target regulatory efforts, such as new standards and criteria development, that respond to identified problems and needs. S. 1178 and S. 1179 contemplate a very prescriptive approach to CSOs and other point sources that in many cases will not reflect the conclusions of the management plans and conferences. CSO control strategies, for example, should reflect the information and strategies that result from these efforts.

S. 1178 and 1179 envision a more active role by the EPA in setting new water quality standards for marine waters and sediment. AMSA affirms the concept of establishing water quality and sediment standards for the marine environment. AMSA urges the Subcommittees, however, to review more fully with EPA some of the problems and limitations of the existing standards-setting process. AMSA believes that regional, state and federal authorities must work in concert to develop standards appropriate to local conditions and capable of sustaining support for achievement. With enactment of the 1987 Act amendments requiring adoption of new water quality standards for the 307(a) list of pollutants, our member agencies have become increasingly involved with the state standard-setting process, with substantial difficulty I might add. It is clear that recent funding reductions are affecting EPA and state efforts to move forward in adopting new standards. EPA's existing criteria are in some cases outdated and not revised to reflect new information. States are facing strict deadlines for action, and consequently site specific work if not already underway is not possible given resource constraints and deadlines.

I would like to expand on the toxics issue specifically as a lead-in to other issues in the bill. S. 1179 proposes new pretreatment requirements on POTW's if toxics are present. AMSA supports a strong pretreatment program that includes local limits based upon site specific environmental consideration. We are now working with EPA to improve this very important clean water program. The bill, however, directly links the presence of toxic pollutants to changes in the pretreatment program. This linkage does not reflect what both we and EPA know about this problem.

Again, in proposing changes in how we approach the problem of CSO correction for marine waters, there is a presumption that subjecting such discharges to secondary treatment requirements, assuming for the moment that this is financially feasible, will in itself correct or respond to the problem of toxics in marine waters. Our experience suggests this linkage will in many circumstances result in major expenditures with little environmental benefit.

Let me describe the program for CSO correction in Seattle and I can state confidently that it reflects the efforts of many larger agencies throughout the county. In 1985 the State of Washington adopted a law that requires "the greatest reasonable reduction (in CSOs) in the shortest possible time." The state Department of Ecology has defined this to mean one discharge per CSO per year. Since the law was passed Metro and the City of Seattle have developed a plan for a 75 percent reduction of CSOs over the next 20 years at a cost of more than $200 million. This is in addition to the more than $800 million in other water quality improvements already scheduled through 1995. In the past 30 years Metro has reduced CSO discharges by 90 percent, so the current plan will eliminate 75 percent of the remaining 10 percent.

A requirement for "elimination" of CSOs would cause us to adopt an entirely different strategy for CSO control and interrupt the current progress we are making.

A specific tenent of the legislation under consideration suggests water conservation as a major CSO elimination strategy. While water conservation is to be encouraged for a number of reasons, it would in fact have little impact on CSO volumes. A 10 percent reduction in residential flow accomplished through water conservation efforts would account for only a three percent reduction in total flow. (The remainder is groundwater infiltration.) Source control is a more prudent method for dealing with CSO pollutant discharges.

I would like to leave you with the following summary points:

1. Additional focus upon the unique aspects and needs of the Marine/Estuarine environment is needed and helpful. However, significant progress has been made in several local environments. Not only has continued decline been halted, but significant improvement has been demonstrated. Congressional efforts should be mindful of these situations to minimize unintended side effects of new legislative requirements which might retard and impede ongoing efforts.

2. The need for effective Marine Water Quality and Sediment Standards is substantial. The process for development of these standards should be one that is technically rigorous and involves regional, state and local as well as federal perspectives.

3. S. 1178 proposes elimination of Combined Sewer Overflows. In AMSA's view and in Seattle Metro's experience this requirement would prove to be disruptive to current progress in the short-term and counterproductive in the long-term. Seattle Metro has worked for several years to craft a CSO control program that would virtually eliminate CSOs as an environmental impact. This program achieves significant reduction but not total elimination. A new federal requirement to do so would stop the progress we are making on our $200 million program and send us in search of a new public consensus and a totally different strategy that would require a minimum of three times the resources.

4. Management conferences, convened to develop and prioritize actions to protect and improve these environments is a preferred method of addressing these needs as opposed to additional prescriptive programs which too often do not reflect the unique potentials and circumstances of local environments.

5. The ability for both EPA and local agencies to effectively implement the new generation of much needed toxics control requirements in the current CWA is substantially limited at the present time by the level of financial and technical resource available. As you consider the specifics of S. 1178 and 1179, it may be prudent to consider a strategy that provides for additions to the law in substance but provides an opportunity to undertake a review of unfinished business under existing CWA provisions before establishing final implementation deadlines for new requirements. I would note that S. 587 reflects the clear need for additional research and study to better understand human impacts on the marine environment and the necessity of exploring new technologies and innovative programs.

6. I believe that we and EPA are coming to some agreement that the pretreatment program can do more in some circumstances than it is presently accomplishing. However, given the task ahead, the pretreatment program can at best be considered only a component of the solution -- one that is approaching a level of diminishing returns on additional investments. The pretreatment program can not be expected to provide significant improvements in marine/estuarine environments beyond what has already been achieved.

Mr. Chairman, I have only briefly reviewed some of the issues before the Subcommittees as you consider new initiatives to improve our coastal waters. Please know that AMSA and its member agencies are prepared to work with you and your staff as you develop new legislation to address these issues.

STATEMENT OF HARVEY W. SCHULTZ, COMMISSIONER
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
to the
SUPERFUND, OCEAN & WATER PROTECTION SUBCOMMITTEE
and the
ENVIRONMENTAL PROTECTION SUBCOMMITTEE
# of the
SENATE ENVIRONMENTAL AND PUBLIC WORKS COMMITTEE

Dirksen Senate Office Building, Washington, D.C.
Tuesday, July 25, 1989

I welcome the opportunity to comment on several legislative proposals to improve marine and coastal environments. Our particular concern is the manner in which combined sewer overflow (CSO) abatement is addressed.

We strongly support S. 587, the Marine Research Act of 1989. In its Findings, this bill announces the authors' awareness of the need to better understand human impacts on the marine and coastal environment, as well as the necessity of exploring new technologies and supporting innovative programs:

> "(p) the results of marine and coastal research are valuable to developing and implementing marine and coastal environmental protection programs at the Federal, State, regional and local levels."

S. 587 thus acknowledges the crucial need for more research to develop environmental protection programs. This does not mean that we advocate waiting for this research to be completed before taking actions concerning CSOs. While such information is being gathered, and while new technologies are being developed, we believe the best approach must be that which is already being vigorously pursued, at a cost of billions of dollars, by some municipalities: the abatement of those CSOs which have the greatest impacts, with the goal of meeting or exceeding all applicable water quality standards.

Considering the wisdom of S. 587, S. 1178 and S. 1179 are by comparison both deficient and premature. These proposals not only ignore the important roles of research, and States, and regions and localities in such programs (as acknowledged by S. 587), but also take the view, as yet unsupported by research still to be accomplished, that the only appropriate regulation of CSOs must result in their total elimination. This is not the case. New York City's view is that the total elimination of CSOs -- either through storage, treatment, or sewer separation -- is not only not appropriate, but is also not achievable.

New York City probably has more combined sewers (6500 miles), and more extensive experience in addressing the abatement of their overflow (40 years), than any other jurisdiction in the country. Both our research and the empirical evidence offered by the variety of experimental and demonstration projects which we have undertaken indicate that the greatest, most meaningful CSO abatement will be achieved through management strategies which focus on attainment and maintenance of appropriate water quality standards. To the extent that the programs prescribed by both S. 1178 and S. 1179 are not centered on such water quality standards, we believe they are seriously misguided, and will result in fruitless expenditure of massive amounts of increasingly scarce resources.

Our CSO abatement program commits the City to an improvement in water quality sufficient to satisfy state standards. The program stresses experimentation with new technologies to effectively mitigate the impact of CSOs. From our long experience, we know that meeting improved water quality standards does not necessitate the extremist and expensive measures prescribed by these bills.

Beyond the issue of the goals of the proposals, the programmatic deadlines contained in the proposals are so excessively short that they cannot be complied with, nor should they be. There is always the temptation to testify to the urgency of a situation by requiring its immediate resolution. But the research, planning and creation of protocols, as well as the design, siting and construction of abatement facilities simply cannot be accomplished that quickly. We have begun the job and actually built such a facility to hold 1 mgd of CSO at Spring Creek in Brooklyn, in 1972. Many years more than the five or seven allocated in these proposals will be needed to implement comprehensive CSO abatement programs, particularly in areas with extensive and complex sewer systems, such as New York City.

In fact, our 10 year plan already calls for $1.5 billion for CSO program work and we have six active projects underway, one of them experimental. A 7th project will begin during this Fiscal Year. However, in many of the areas proposed for regulation no "quick fix" exists and technology still remains to be developed. Implementation schedules must consider the magnitude of the program and the resources of the municipality. While we are in full agreement about the importance of CSO abatement, we are in thorough disagreement with the imposition of deadlines so hopelessly short as to make the careful and worthwhile accomplishment of such abatement impossible.

Comments on individual provisions in these proposals are appended to this statement. We look forward to working with Congress on developing a legislative proposal which will serve as an effective blueprint for the achievement of CSO abatement.

Comments on S. 887, Marine Research Act of 1989

As the most knowledgeable and experienced organizations in the field of CSO abatement and research, municipalities and localities must be made full partners with the States and Federal agencies concerning participation on the Research Advisory Groups and all other research and development initiatives. Some of the most promising technologies have been developed under municipal programs designed to address coastal and estuarine water quality issues. Local organizations must be encouraged to submit research proposals and share their data and information with other concerned groups. As those who must bear the burden of improving coastal and estuarine water quality, these local agencies offer knowledge and experience which will be necessary for the success of any of the ambitious and worthwhile research accomplished under this bill. The bill should be amended to allow for this inclusion.

Comments on S. 1178, Marine Protection Act of 1989

Section 2, Findings: As detailed in the attached statement, we strongly disagree with finding (K) -- that there is a need to completely eliminate CSO discharges.

Section 101, National Estuary Program: We encourage and support the expansion of this program and the increased role of EPA in research and assessments, if accompanied by recognition of the probable need for related resources. The appropriations to the Administrator for grants for these programs do not reflect the stated commitment of the proposers.

Section 102, Coastal Discharge Standard: We strongly object to the blanket requirement for offsets in the case of all new and increased discharges ((q)(1)(B)), without consideration of the water quality of the receiving water body. If, even with the new or increased discharge, the water body still meets water quality standards, then the new discharge should also be permitted. There is no practical reason for the stringent requirement in the legislation. Offsets have never been applied to POTWs, and their use in this case could well result in the cessation of any new development in many coastal regions. Especially in the case of residential development, increased flow does not necessarily correspond with decreasing water quality.

Section 105, Marine Combined Sewer Overflow: Again, we strongly disagree with the requirement in Section 406(b)(1) for the development of a plan for the elimination of all discharges. Furthermore, the 3-year implementation deadline is absurd; we maintain that thoughtful progress towards CSO abatement -- let alone elimination -- cannot be accomplished in this impossibly short time frame.

Section 106, Coastal Water Quality: This Section duplicates existing regulation under the Clean Water Act, where states are the parties responsible for establishing water quality standards.

Comments on S. 1179, Comprehensive Ocean Assessment and Strategy (Coast) Act of 1989

Section 5, National Marine Environment Assessment: We agree that water quality effluent limitations should be the focus of management strategies (Section 304 (n)(1)(B)); however, the three-year implementation time limit is unreasonable.

Section 6, Marine Environment Toxic Release Inventory Assessment and Strategy: This section seems entirely duplicative of CWA's 304(l). Also, the Toxics Release Inventory should tie in with other EPA lists of toxics.

Section 10, Marine Combined Sewer Overflows: Again, requiring the development of regulations to eliminate all overflows is neither an appropriate nor reasonable assignment. The issuance of guidance suggesting alternatives for CSO control is appropriate, although we wish to stress again the need for increased research and development as the basis for any such guidance.

Also under Section 10(c), new provision 402(o)(4)(B) states the appropriate water quality goals for regulation of CSO's, while 402(o)(4)(C) refers to the technologically impossible and unnecessary elimination of CSO's.

Section 11, Pretreatment Requirements: Section 307(f)(1) should read: "shall require the publicly owned treatment works to establish or revise its pretreatment program within one year to eliminate the pollutants to the extent that they contribute to the violation of the standard," and should provide more than one year for such revision.

Section 12, Marine Stormwater Discharges: Stormwater requirements were promulgated earlier this year by EPA. The proposal to add the Administrator's determination of "reasonably likely" will result in too much uncertainty and will be detrimental to effective implementation of the regulatory program.

Section 13, Marine Monitoring, Research and Studies: The use of whole effluent biological toxicity testing (W.E.T.) is utterly inappropriate for CSO's because of dilution and mixing, and the extreme variation in water bodies and storm events. W.E.T. is also very expensive, particularly considering that the results are considered to be inconclusive even in the case of treatment plant effluent, the character of which does not vary nearly to the degree that does CSO effluent. .

The proposers have obviously not considered the impossibility of setting standard protocols in the case of CSO's. Aside from the difficulty of sampling from many of the City's own CSO's, there is the question of mobilizing literally hundreds of samplers in the event of a storm. The level of toxicity changes dramatically depending on the time of day, duration of event, and at what time during the event a sample is taken. To require W.E.T. testing of CSO's consitutes a tremendous waste of taxpayer money with, almost certainly, no gain in knowledge.

An appropriate alternative would be to establish background toxicity testing for the waterbody impacted by CSO's. For a storm event, testing protocols could be determined according to the local rainfall average and duration. Areas for testing would be established with the State and approved by EPA upon study of trends and any available modelling. The water body would be treated as an overall system.

In subdivision (f), the proposers probably mean to say "algal blooms" not "toxic algal blooms." The major problem with algal blooms has been eutrification, which occurs when normal blooms become overly enthusiastic in the presence of abundant food, sometimes drastically depleting the supply of oxygen in the water. Such blooms are not "toxic", but do present an obvious predicament.

Section 14, Information Transfer: This provision appears to reinvent the wheel. Other national databases exist, none of which has been adequately funded to be useful.

Section 15, Study of Federal Agency Programs: This is a good idea, although inadequate time is given to perform what is required. Also, follow-through to see that the recommendations receive attention is necessary, or the effort is wasted.

Section 16, Ocean Dumping Penalties: No distinction is made between permitted and non-permitted disposal activities. If the penalties are meant to apply to both, the only accomplishment will be the further punishment of municipalities, permitted pursuant to the provisions of the Ocean Dumping Ban Act of 1988, currently seeking alternative methods to ocean disposal. Such penalties are wholly unjust and unnecessary.

Section 17, Authorization: The funding under Section 17 is paltry and does not correspond with the purported Federal commitment to improve water quality.

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WRITTEN STATEMENT OF THE
COUNTY SANITATION DISTRICTS OF ORANGE COUNTY, CALIFORNIA
FOR THE
SENATE SUBCOMMITTEES ON
ENVIRONMENTAL PROTECTION AND SUPERFUND, OCEAN AND WATER PROTECTION

JULY 29, 1989

"THE GOOD NEWS IS - THERE'S NO BAD NEWS"

BY
BLAKE P. ANDERSON
DIRECTOR OF TECHNICAL SERVICES

The County Sanitation Districts of Orange County are an environmental success story. Discharging 260 million-gallons-per-day of treated municipal wastewater off the coast of Southern California through a ten-foot diameter ocean outfall that extends four miles off the coast into 200 feet of water, the Sanitation Districts have been effectively and continuously protecting marine water quality and its beneficial uses. In the last two years, the Sanitation Districts have received EPA's Award of Operational and Maintenance Excellence which is given to POTW's that achieve high standards of performance.

The Sanitation Districts is the only large metropolitan discharger with an active 301(h) secondary waiver ocean discharge permit. While the waiver permit relaxes the standards on biochemical oxygen demand and suspended solids, it maintains stringent toxic limitations and prohibits significant adverse environmental impacts. Effective in 1985, the permit requires the Sanitation Districts to provide tough industrial waste source control and to conduct a $2 million per year ocean monitoring program to assess the effects of the modified discharge on the marine environment.

Combined with a well-planned and well-financed wastewater facilities construction improvement program, the Sanitation Districts have maintained consistent compliance with all federal and state permit requirements, receiving water criteria and all statutory requirements. Presently the Sanitation Districts are providing advanced primary treatment to all of the flow they treat, and secondary treatment to half of the flow.

The Sanitation Districts' aggressive source control program is successfully limiting the discharge of toxics to the environment. It has been so effective that incoming raw sewage quality actually meets all of the marine water quality criteria for toxic pollutants. Attached to this written testimony is a copy of the brochure that describes the success of the industrial source control program. Think of it as "the Good News Graphs". They show that since the inception of the industrial source control program in 1976, there has been

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a substantial decrease in toxic metals discharged to the ocean and that the discharge quality is beeter than all discharge standards.

The results of the Sanitation Districts' ocean monitoring program have shown that the beaches of Orange County are safe for swimming and shellfishing. Marine water quality is not being adversely impacted by the discharge. The fishes and invertebrates caught off the Orange County outfall for human consumption consistently meet FDA limits for PCB and DDT. Effluent monitoring results show that DDT and PCB are below detectable levels. The federal ban on PCB and DDT and the Sanitation Districts' strict source control program have resulted in this fine record of achievement.

The Sanitation Districts have recently completed a 30-year Master Plan and environmental impact report which identifies the facility and program needs to the year 2020. This overall program entitled "2020 VISION" contains 11 elements that will assure continued protection of public health and the beneficial uses of the ocean, will provide for the wisest management of limited public and natural resources, and will promote balanced environmental management. A brochure describing the program is attached. The 11 elements of 2020 VISION are:

- ocean protection
- balanced environmental management
- long-term wastewater facilities planning and financing
- toxic source control
- beneficial reuse of sludge
- water reclamation
- water conservation
- consistent regulatory compliance
- energy conservation
- research
- public education

The Sanitation Districts are proud of their achievements and are prepared to move into the 21 century with confidence, continuing their long-standing commitment to sound, cost-effective environmental management based on supportable, scientific data.

REF #910170.rp

Statement
# of the
American Institute of Marine Underwriters

prepared for the
Subcommittee on Environmental Protection
Committee on Environment and Public Works
United States Senate

on

Oil Spill Liability and Compensation
Legislation

July 25, 1989

The American Institute of Marine Underwriters (AIMU) is pleased to have this opportunity to present its views before this Subcommittee on legislation relating to the establishment of a comprehensive system of liability and compensation for oil spill damage and removal costs. AIMU is a non-profit trade association representing over 100 marine insurers whose members underwrite over 90% of the marine insurance done in the United States. The American marine insurance market has been involved in insuring pollution liabilities arising from federal statutory provisions for the past fourteen years. The Water Quality Insurance Syndicate (WQIS) is a pool of 35 marine insurers from the American market, which insures liabilities imposed on vessel owners and operators by the Federal Water Pollution Control Act Amendments (FWPCA), the Outer Continental Shelf Lands Act Amendments (OCSLAA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). In addition, WQIS insures the liability of vessel owners and operators to third-parties for property damage caused by pollution. In conjunction with coverage of the liabilities under FWPCA and OCSLAA, WQIS provides the Coast Guard with the evidence of insurance required by vessel operators for certification of financial responsibility. In total, WQIS insures liabilities from oil or hazardous substance pollution for over 15,000 vessels operating primarily in the inland and coastal waters of the United States.

There are currently at least three insurance facilities or pools as well as several individual companies within the American market which underwrite risks for mobile drilling vessels and fixed offshore installations located on the Outer Continental Shelf and elsewhere throughout the world. Their coverages include pollution exposures. These pools and companies provide an alternative United States insurance market for the offshore oil industry.

We are pleased to offer our views on the legislation before you on the basis of the unique experiences and perspectives of the American marine insurance market. Consideration of this legislation is particularly appropriate in view of the tragic spill in Prince William Sound. We would urge that the Subcommittee bear in mind the fact that, despite the magnitude of the Exxon Valdez incident, all but a handful of spills have been adequately covered by limits of liability in existing legislation.

Because of this one incident involving a VLCC, it would be unfortunate to enact legislation which would be harmful or overly burdensome for the segment of the maritime industry serving the inland, harbor, and coastal waters of the U.S. which has had, on the whole, a good record.

Preemption

It is vital to the workability of the oil "Superfund" proposal that it establish a uniform and exclusive statutory scheme covering oil pollution on and in navigable waters and for claims for damages caused thereby. It must preempt state laws in order to eradicate the existing patchwork of conflicting and confusing federal and state law. Vessels must be permitted to move freely from one state jurisdiction to another without the burden of meeting financial responsibility requirements in each separate state and without being subjected to multiple regimes of law imposing varying degrees and limits of liability. Furthermore, comprehensive oil spill legislation should be the exclusive federal regime. To allow redundant requirements at the state level would not assure greater protection for U.S. citizens but rather would encumber unnecessarily maritime transport and increase costs to the ultimate consumer.

A truly comprehensive, preemptive oil spill liability regime is to the advantage of claimants, including state governments. When one federal regime is in place providing true security, all damaged parties will receive adequate protection. It is senseless to encourage states to continue to enact conflicting, uninsurable liability regimes when sure and reliable protection can be established through one comprehensive regime.

Limit of Liability

S. 686 proposes a very substantial increase in limits of liability for tankers carrying oil ($500 per gross ton or $10,000,000.00 whichever is greater). In a departure from existing law, inland oil barges which operate in our domestic rivers and coastal waters would be in the same class as huge foreign oil tankers. A $10,000,000.00 limit for an inland oil barge is tantamount to no limitation at all. Throughout WQIS' 14 years of experience with thousands of oil spills, there has never been an oil spill from a domestic barge which approached $10,000,000.00. Among the thousands of spills WQIS has been involved with, the largest clean-up costs as a result of a spill from a barge amounted to less than $1,000,000.00. The next largest was $570,000 involving three barges in the same tow. All others have been substantially less.

The proposed limits would impose heavy burdens on small and medium sized operators possibly disrupting marine transportation of oil and related products. Inland oil barges owned and operated by small and independent operators would find the proposed limitation of liability especially onerous. Experience in the industry gives no jusification for this radical departure. It is also inconsistent with the treatment of land based facilities. See Section 102(c)(4)(A) of S. 686.

S. 1223 provides for unlimited liability of the "responsible party" for all clean-up costs and damages. This provision would be completely unworkable. Insurance companies cannot underwrite risks with no limits of liability. To do so would be irresponsible. Without a clearly defined cap on potential costs in the event of a spill, an underwriter cannot assess the risk.

Liability of non-spilling vessel

There is no provision for the application of the oil Superfund scheme to a vessel which causes a spill from another vessel, through collision or otherwise. We believe that this is a serious deficiency. Section 102 of S. 686 provides that owner or operator of the vessel from which oil is discharged or which poses a threat of discharge is liable for damages and removal costs. There appears to be no provision parallel to §311(g) of FWPCA which sets out the liability and limitations of a third party, such as a nonspilling vessel which causes a spill from another vessel. Of course, all vessels over 300 gross tons (except a "dumb barge" not carrying oil) would be required to maintain evidence of financial responsibility under the proposed bill. The financial security would only be available to the government and other claimants for settlement of claims only if the actual spiller is liable under §102. Without a provision similar to §311(g), claimants could be faced with unsecured claims and there would be a question as to what regime of law would apply to the non-spilling, causing vessel.

Entitlement to Limitation

Section 102(c)(2)(B) of S. 686 provides that a responsible party is not entitled to a limitation if he "fails or refuses" to report a spill or to provide "all reasonable" cooperation with the responsible Federal official. We are concerned about what action must be taken to constitute "all reasonable" cooperation. If a vessel owner or operator has limited financial resources and if the cost of completing the cleanup is beyond his ability to pay, would he fail to provide "all reasonable" cooperation if he is forced to ask the government to take over cleanup?

Defenses

One important consideration for insurers is the maintanance of adequate defenses. The current defenses provided in FWPCA have been eroded in S. 686 even though experience lends no support to the narrowing of these defenses. Section 102(b)(1)(C) of S. 686 provides that there would be no liability if the incident is "solely" caused by an act of a third party other than "one whose act or omission occurs in connection with a contractual relationship with a responsible party." . It is improper and contrary to tradition in maritime law to hold a "dumb barge" which is innocent of any wrongdoing responsible for a spill caused by a towing tug owned by someone else. The existence of a simple towing contract between the tug and the barge should not justify the denial of the traditional concept of the independent liability of a tower under contract to a barge owner. See generally The Law of Tug, Tow and Pilotage, 2nd Edition (1982) by Alex L. Parks, page 22 et seq.; The Law of Admiralty, 2nd Edition (1975) by Grant Gilmore and Charles L. Black, Jr. at page 516; See for example, The Fort George, 183 F.731 (2nd Cir. 1910), cert. denied, 219 U.S. 589, 31 S.Ct. 472 (1911).

There are other instances in which the operation of this provision would be unfair. Often an oil company will contract with a vessel owner for transportation of oil. If there were a spill from the vessel due to negligence of the oil company's shore side personnel or due to defective terminal equipment during the loading or unloading of cargo an inequitable situation could arise. The vessel, by virtue of the contract with the oil company, could not avail itself of the defense that the oil company was a negligent third-party who caused the spill.

Section 102(b)(2) requires that an oil carrying vessel, which "alleges" that a spill was caused solely by a third party, must "promptly" pay the costs of removal and damages and then be subrogated to the rights of the United States government. It is inequitable that a totally innocent oil carrying barge be required to pay all costs up front and then be subrogated to the government's rights against the causing vessel. The meaning of "allege" is unclear. In the case where the facts show that there can be no dispute as to the cause of a spill, must the oil carrying vessel still pay first and then attempt recovery? We recommend that the last sentence of §102(b)(2) be deleted.

Financial Responsibilities

In Section 104(d), an insurer is denied defenses to a direct action which were accorded to insurers under FWPCA. Despite misdeclarations or fraud by an assured and consequent acceptance of a risk which might otherwise have been rejected, an insurer might be subject to much higher exposure than anticipated. This flies in the face of traditional general insurance law. We recommend that §104(d) be amended to parallel FWPCA §311(p)(3).

Penalties

The subcommittee is considering legislation which would radically increase penalties for accidental oil spills. These penalties are so onerous that they could lead to the destruction of the domestic oil transportation system. Parallels have been drawn with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the need to follow CERCLA's provisions to deter oil spills. This approach ignores the basic difference between accidental oil spills and the planned disposition of hazardous wastes. Most oil spills are caused by human error. The best way to reduce human error is through extensive training and licensing procedures. While there may be some jusification for imposing severe penalties in the case of gross negligence on the part of management, severe penalties will do little to deter most oil spills.

Responsibility of Cargo Owners

S. 1223 would make anyone with an ownership interest in the oil jointly and severally liable for all removal costs and damages despite the fact that the cargo owner may have no control over the handling of the product while in transport. Certainly the shared responsibility concept developed over the years in the comprehensive oil spill legislation is a more appropriate way for cargo interests to share in oil spill costs. Shipowners and operators are liable up to a specified limit. Above that limit a fund contributed to by oil cargo interests assumes responsibility. Such an approach would assure funds on hand rather than forcing a hunt for the actual owner of the cargo who may be outside U.S. jurisdiction. Provided that vessel limits are clearly defined and reasonable, the comprehensive oil spill legislation approach is more equitable and workable.

Thank you for this opportunity to contribute the American marine insurance market's view on a matter of such importance. AIMU stands ready to assist the Subcommittee in any way we can.

Water Pollution Control Federation

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TESTIMONY OF KRIS LINDSTROM
ON BEHALF OF THE WATER POLLUTION CONTROL FEDERATION

JOINT HEARING OF THE SUBCOMMITTEE
ON ENVIRONMENTAL PROTECTION AND THE SUBCOMMITTEE ON SUPERFUND,
OCEAN AND WATER PROTECTION

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

U. S. SENATE

Marine and Coastal Waters Protection Legislation
S. 1178, S. 1179, S. 587 and S. 588

July 25, 1989

PRESIDENT	PRESIDENT-ELECT	VICE PRESIDENT	TREASURER	PAST PRESIDENT	EXECUTIVE DIRECTOR
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My name is Kris Lindstrom. I am President of an environmental consulting firm based in Sacramento, California, and am here today in my capacity as Chairman of the Marine Water Quality Committee of the Water Pollution Control Federation (WPCF). WPCF's 34,000 members are civil and environmental engineers, wastewater treatment plant operators and managers, state and municipal officials, and many others working in federal agencies, industry, academia or private practice to improve water quality.

I have a B.S. in Biology, a Masters degree in Public Health, and a Masters Degree in Ecology from the University of California and have applied this formal knowledge to solving various wastewater management problems over the past 19 years.

Evaluating environmental impacts of wastewater projects -- primarily on California's marine environment -- has given me insight into coastal pollution issues. These projects have ranged from septage disposal projects, collector sewers and interceptor sewers (both gravity and force mains), treatment facilities of all types, and disposal via outfalls as well as land disposal and wastewater reclamation/reuse projects. I have also been involved in projects assessing the impacts of wastewater residuals (sludge and ashes) management.

Working with numerous agencies and citizens at workshops or information forums and public hearings has allowed me to hear the concerns of the public and recognize the gap between what is known scientifically about a particular water body and its resources and what is reported in the popular press. Caught in between are those that have to make decisions which often involve billions of dollars. The legislation under consideration here today will help close the gap.

Before I comment on the specific bills before the subcommittees today (S. 1178, S. 1179, S. 587 and S. 588), I would like to share a few observations with you:

(1) **Accomplishments to date.** The current coastal pollution crisis is overshadowing long-term improvements in water quality which have been made at a cost of billions of dollars. For example, in California, a dramatic decline in toxics and organic loading to the marine environment has been achieved by publicly-owned treatment plants despite steady increases in wastewater flows. This has been a result of source reduction and pretreatment by industry, and construction of new treatment facilities, many of which were built with Clean Water Act construction grant funds.

(2) **Site-specific solutions.** The nation is now entering an era of increased demands for environmental improvements and pollution control to protect land, air and water resources and public health. Unfortunately, resources are limited and thus we must require a more refined definition of problems so as to focus pollution prevention efforts and get the greatest improvements for the lowest resource expenditure. We cannot require broad-brushed technological solutions, but must tailor needs to local conditions and environmental problems through careful examination of data, evaluation of alternatives, and wise selection of a program that strikes the best overall environmental balance.

(3) **Existing laws and regulations are adequate.** Major advances have been made in improved treatment in many areas in response to existing national and state regulations. When these are not enforced or the local will to implement them is lacking, there are likely to be water quality problems.

(4) **Historical or chronic contamination.** Often coastal sediment contamination is the result of years of chronic pollution (i.e. DDT or PCB contamination of sediments before the substances were banned), from a variety of sources, particularly stormwater or urban runoff. Point source contamination in many areas has decreased dramatically as a result of pretreatment, improved treatment and construction of deeper outfalls providing for greater dispersion.

(5) **Pretreatment and waste minimization.** Treatment of wastewater is only a partial solution; pretreatment and removal or elimination at the source is the most effective means of controlling toxic pollutants. Many chlorinated hydrocarbons which can be uptaken and concentrated through the food web to higher animals such as fish and marine mammals are not removed by conventional treatment processes. Although product elimination or substitution has resulted in significant decreases of certain chemicals (i.e. banning DDT, PCBs, chlordane, etc.), large quantities of these materials and their breakdown products still exist in the environment and continue to undergo partitioning into various environmental media.

(6) **Beneficial use of nutrients.** POTW's are still major sources of nutrients to the coastal zone. Nutrients can only be removed through advanced treatment. Therefore,

we should seek ways to make beneficial use of nutrients, such as in wetlands, aquaculture systems, proper dispersion and assimilation in ocean waters.

(7) **Public education.** Public education is a key to seeking consensus on solving identified problems. WPCF is committed to helping in this effort through production of brochures and video tapes. One such brochure, called Household Hazardous Waste, was distributed to 40,000 Atlantic City residents last year, and 90,000 more will be distributed this year.

(8) **Need for research.** Continued research is needed to understand marine ecosystems and the effect of man's activities on them. Proposed legislation (S. 587 and S. 588) will help in this effort.

(9) **Monitoring and data.** Coordinated and consistent monitoring programs whose results can be logged in centralized databases for use by dischargers, regulators, planners and scientists are needed. Long-term consistency in sampling efforts such as the NOAA Status and Trends Program needs to be supported. Major recommendations on such efforts are forthcoming from the National Research Council.

(10) **Criteria and standards.** Acceleration of criteria and standard development is needed. Water quality standards, sediment quality standards and the criteria for judging the quality of seafood are now lacking and can serve as important tools in assessing the extent of degradation, the specific abatement efforts, and the success or failure of remediation efforts. State resources are lacking in this important area, and federal efforts and coordinated development of such criteria and standards is needed.

(11) **Nonpoint source pollution.** Recognition of the importance of nonpoint source pollution and channeling of resources into the control of these sources is of major importance. Funding of nonpoint source control programs is essential. Section 319 of the 1987 Water Quality Act authorized $400 million over a four-year period for state nonpoint source programs. To date the programs have received no federal funding. Planning coordination and land use impacts on water quality are of key importance to maintaining and improving water quality. The National Estuary Program may be an appropriate vehicle to facilitate regional solutions.

Key provisions in S. 1178 and S. 1179 will expand existing water quality protection strategies including:

-- Designation of degraded coastal waters which do not support a balanced indigenous population of shellfish, fish, and wildlife or allow recreational activities in and on the water. This section will help define what a balanced indigenous population is and what constitutes "degradation." Existing legislation, regulations, and guidelines are inadequate to define degradation criteria. Also this will help set clean-up priorities.

-- Requirements for more site-specific and stringent pretreatment programs in designated areas will focus control efforts on specific sources and contaminants.

-- Supplementation and acceleration of the development of water quality and sediment criteria which can serve as guidelines or used by states in adopting standards for protecting water quality. Many standards are now lacking and no sediment criteria exist which impedes progress in identifying contaminated or degraded areas.

-- Improved control of contaminated dredge material. Quality criteria and record-keeping are now lacking in many areas. Pending legislation would require closer regulation of the time of year and location of dumping.

-- Research on the potential use of microorganisms to degrade pollutants in municipal and industrial waste streams prior to marine disposal. The proposed report will identify possible new strategies which appear to have great potential for use in clean-up of contaminated areas or for routine use in POTWs. No such comprehensive overview now exists to my knowledge.

Marine Research Programs

Two of the bills before the subcommittee, S. 587 and S. 588, will enhance existing federal efforts in marine research. I have several comments on the need for increased marine research.

National resources now committed to marine research and monitoring are very limited. Every effort to support further work in this vital area is welcomed by those of us in the water pollution prevention business.

The authors of the bills should be commended for their thoughtfulness and in-depth knowledge of marine programs' needs. The bills' comprehensive, yet detailed, approaches are noteworthy. Specification of project selection criteria, and a requirement that monitoring methods be consistent, are two particularly important proposals.

Through my work on environmental assessment training in the Trust Territories I have seen that a little federal funding can go a long way. The data which resulted from modest expenditures (tens of thousands of dollars) to conduct baseline water quality surveys, mapping of coastal resources, and publication of results, was invaluable to local authorities who had to make informed decisions on major projects which could have long-term impacts on the marine environment. Without some of the baseline data on water quality or marine resources or how resources can be affected by human activities, assumptions are often made which can have unforseen long-term damage to vital marine resources. Such impacts can range from the destruction of reefs by sedimentation to the uptake of trace amounts of toxic pollutants or suppression of dissolved oxygen levels. All of these impacts can be avoided or mitigated if scientific assessments of impacts are made by those with the knowledge and capability to assist local governments.

S. 587 provides for the preparation of comprehensive and periodic reports on environmental conditions and research needs and response programs. There is definitely a need for some group (such as the proposed regional marine research programs) to provide oversight and put what is known or not known into perspective. Such information is vitally important to measuring the success or failure of other environmental improvement programs such as the construction of wastewater facilities under the mandates of the Clean Water Act and other federal, state or local environmental efforts to abate nonpoint sources.

The Regional Marine Research Programs outlined in Section 504 of S. 587 are right on target from the perspective of a marine scientist involved in marine monitoring and assessment. That "laundry list" of activities, such as development of standard analytical and monitoring techniques to evaluation of data to determine the impact on various resources, should be applauded.

Section 504(b)(8) and Section 504(b)(9) are particularly important to state and local agencies if the Marine Assessment Division of NOAA must analyze research data and make scientific recommendations to address identified problems. The attached copy of an interview with NOAA official Daniel J. Basta describes some of the NOAA's activities and their usefulness in environmental assessment efforts.

S. 587 (Section 504(e)(2)(H)) states that the management and administration of the programs should be cost-effective and efficient and make maximum use of existing resources. It goes even further to encourage coordination and sharing of equipment and resources. This is an important point that needs emphasis. More resources need to be spent on the analysis of existing data and coordination of existing programs before embarking on new programs. The ranking of projects and funding is also well defined, which is important also (Section 504(f)).

For the designated California Region which lies from Point Reyes south, I would suggest adding some language such as was done for the Caribbean, relating to international participation. Scientists in Mexico could participate as Ex-Officio members. You are probably well aware of the problems caused in U.S. coastal waters by untreated sewage from Mexico's border cities, and the need for cooperative solutions. Mexico has a large number of marine scientists who lack resources, but whose talents could be brought to bear on regional programs.

Conclusion

The four legislative proposals contain some important enhancements to existing legislation which will provide additional controls and management strategies for abating or preventing coastal pollution. In considering the provisions in the bills it is important to recognize:

(1) accomplishments made by POTW's to date.

(2) the need for site-specific rather than broad-brush technological solutions.

(3) that existing laws and regulations are adequate to control most sources provided aggressive enforcement is used.

(4) that much of the coastal contamination is related to historical sources of pollutants.

(5) that pretreatment and waste minimization are key components of any contaminant abatement programs.

(6) new thinking about the beneficial uses of nutrients from POTW's needs to be initiated.

(7) that there is a need for public education on marine pollution problems.

(8) that much more monitoring and research efforts and funding is needed in coastal waters. Long term programs with accessible data bases are in need of support and

funding.

(9) that acceleration of the development of criteria and standards are needed.

(10) that nonpoint source pollution is becoming an increasingly important source of pollutants to the coastal zone. More planning, identification of control measures, and funding is needed to help local governments come to grip with controlling nonpoint sources.

Thank you for allowing me the opportunity to testify before you today. I would be pleased to answer any questions you may have.

PROTECTION OF MARINE AND COASTAL WATERS

FRIDAY, AUGUST 11, 1989

U.S. SENATE, COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION AND SUBCOMMITTEE ON OCEANOGRAPHY, COMMITTEE ON MERCHANT MARINE AND FISHERIES, U.S. HOUSE OF REPRESENTATIVES,

Portland, ME.

EXPLANATORY NOTE

A transcript of the question and answer portion of this hearing was not produced due to circumstances beyond the control of the committee. What follows is the statements and additional material submitted for the record by the witnesses.

The committee would like to acknowledge the appearance and testimony of Hon. James Reed Coles, a Representative in the Maine House of Representatives and Mr. Edward Blackmore, executive director, Maine Lobsterman's Association.

To all the witnesses who expended the time and energy to prepare testimony and appear at the hearing, the committee offers its apologies.

STATEMENT OF
SENATOR GEORGE J. MITCHELL
HEARING OF THE SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
COASTAL RESEARCH AND PROTECTION
AUGUST 11, 1989
PORTLAND, MAINE

Good morning ladies and gentlemen. I want to welcome everyone to this hearing on issues related to research and protection of our coastal waters.

Today's hearing is a joint effort by the Senate Environment Committee, of which I am a member, and the House Merchant Marine Committee, represented by Congressman Joseph Brennan. Rep. Brennan and I have worked cooperatively on coastal legislation and I am confident that this team effort will substantially increase the likelihood of prompt action by the Congress in this important area.

The Gulf of Maine is a resource of tremendous importance to our State in both economic and environmental terms. We take pride that the waters along the vast majority of Maine's 3,500 miles of coastline are still clean and do not now face the overwhelming pollution problems found in many other parts of the country.

Only last summer, beaches were closed throughout the Northeast after discovery of medical waste and other pollution problems. Lobsters taken from ocean dumping areas off the New Jersey coast have large "burn holes" as a result of pollution. Shellfish in Chesapeake Bay and coastal North Carolina have been decimated by disease. There is a large "dead zone" in the Gulf of Mexico. We face huge clean-up problems in many east coast harbors, including Boston Harbor. And, on the west coast, toxic chemicals, including PCBs, mercury, and heavy metals, are in the sediments of major harbors.

Concern for a growing national trend of marine pollution is confirmed by recent scientific studies. The Congressional Office of Technology Assessment has issued a report concluding that the overall health of many of our estuaries and coastal waters "is declining or threatened." The report states --

> "...even if total compliance with today's regulations is achieved, existing programs will not be sufficient to maintain or improve the health of all estuaries and coastal waters. In the absence of additional measures to protect our marine waters, the next few decades will witness new or continued degradation in many estuaries and coastal waters around the country."

Almost two years ago, I held a hearing on coastal protection issues here in Portland. There was general agreement at that hearing that the Gulf of Maine is still clean, but that there were early warnings of developing pollution problems. Several witnesses commented that prevention of more serious problems would require building a first-rate marine research and protection program.

Since that hearing two years ago, we have a better understanding of the pollution threats to the Gulf of Maine. And, we have heard new concern for the quality of specific geographic areas, such as Casco Bay.

The growing evidence of serious marine pollution problems around the country and the evidence of pollution threats to coastal waters here in Maine has convinced me that it is time to substantially expand coastal research and protection programs. Based on this concern, I have recently introduced legislation to expand marine research programs and strengthen existing programs for the protection of coastal waters.

The Marine Research Act, which I introduced in the Senate and Rep. Brennan introduced in the House, will build our capability for research and monitoring of marine and coastal waters. The bill would establish ten multi-state regional marine research programs to support and coordinate research at the regional level, including a research program for the Gulf of Maine.

Regional research programs would be operated by groups of marine research institutions in each region including universities, State agencies, and private laboratories. Each region is to develop a three year plan for research and monitoring in the coastal waters of the region and would be eligible for basic support grants of up to $3 million each year.

Regional research and monitoring will help to build the solid scientific foundation we need to understand the marine environment and to design and implement pollution control measures over the long-term. This research is essential if we are to identify and prevent threats to the marine environment before they grow to be unmanageable and costly problems.

Addressing the serious marine pollution problems which now exist in many areas of the country will require that we follow-up expanded research programs with tougher pollution prevention and control programs. The Marine Protection Act (S. 1178), which I introduced this June, will improve a number of existing programs for reducing pollution to coastal waters.

My legislation would expand the National Estuary Program established in the Clean Water Act by requiring the EPA to prepare a comprehensive list of coastal waters experiencing a general degradation of environmental conditions. In addition to development of Federal/State management conferences for these areas, the bill would provide new authorities for the protection of designated waters.

For these designated waters with serious water quality problems we must make every effort to hold the line on pollution and, at a minimum, keep these waters from getting any worse. To accomplish this, my bill provides a new "coastal discharge standard," to apply to discharges in designated waters, which would require a showing of the need to discharge and no net increase in total pollution to the waterbody. Designated problem waters would also be subject to tougher requirements for wetlands assessments, pretreatment of industrial wastes, stormwater control, and nonpoint pollution control.

Recently, we have learned more about pollution threats to Casco Bay. Pollution problems in the Bay were documented in several reports, including a State of Maine "Agenda of Action" to protect the Bay.

My legislation includes a provision, similar to legislation Rep. Brennan has introduced in the House, which would add Casco Bay to the list of estuaries to be considered for inclusion as part of the National Estuaries Program. The listing of Casco Bay, along with the new authorities provided under the expanded estuaries program, will complement State and local efforts to protect the Bay.

Another key provision of the bill would amend the Clean Water Act to establish a process for assessing and eliminating the overflows to marine waters of combined sanitary and storm sewers.

Conentional open pipe discharges are not the only source of pollution to coastal waters. Nonpoint pollution from city streets, agricultural activities, and construction projects is thought to be a major source of coastal pollution. The bill proposes to establish a voluntary information and education program for coastal landowners. And the bill would give States a greater say in Federal programs which influence coastal development, such as Federal flood insurance.

Other provisions of my legislation would address the problem of adopting enforceable standards for toxic pollutants in marine waters and control of toxic contaminants in marine sediments.

Today's hearing will build on testimony provided in two previous hearings on coastal research and protection held in Washington last month. I look forward to hearing the views and comments of the witnesses who have agreed to testify today, including representatives of State government, the fishing industry, the research community, and environmental groups.

When the Congress reconvenes in September, I plan to work with my colleagues to revise coastal research and protection legislation based on testimony at this and other hearings. Development of this legislation is essential if we are to keep pace with the growing threats to the marine environment and assure that this resource is protected for future generations.

Thank you.

STATEMENT OF

REPRESENTATIVE JOSEPH E. BRENNAN

HEARING OF THE SUBCOMMITTEE ON OCEANOGRAPHY

COASTAL RESEARCH AND PROTECTION

AUGUST 11, 1989

PORTLAND, MAINE

GOOD MORNING, LADIES AND GENTLEMEN. AGAIN, SENATOR MITCHELL AND I WOULD LIKE TO THANK YOU FOR ATTENDING THIS HEARING ON THE VERY IMPORTANT ISSUE OF PROTECTING MAINE'S, AND THE NATION'S, COASTAL WATERS.

IT IS A PRIVILEGE TO BE HERE WITH SENATOR MITCHELL THIS MORNING, AND THE HOLDING OF THIS HEARING DEMONSTRATES THE IMPORTANCE WHICH THE SENATOR AND I ATTACH TO THE TASK OF PASSING SUBSTANTIVE LEGISLATION ON THIS ISSUE IN THE NEAR FUTURE. THE ENVIRONMENT IS AN ISSUE WHICH

CROSSES BOTH STATE AND PARTY LINES, AND I BELIEVE THAT COOPERATION BETWEEN THE HOUSE AND SENATE, AS WE HAVE TODAY, CAN ONLY MAKE THE PROSPECT OF EFFECTIVE AND PROMPT LEGISLATION MORE LIKELY.

DURING THIS TIME OF YEAR MANY PEOPLE'S MINDS TURN TO THOUGHTS OF THE SEASHORE. CLEAN, UNPOLLUTED OCEANS AND BEACHES ARE SOMETHING MANY OF US IN MAINE TAKE FOR GRANTED. THE PURPOSE OF TODAY'S HEARING IS TO ALLOW US TO GAIN FURTHER INSIGHT ON THE STATE OF THE GULF OF MAINE, TO EXPLORE THE STATUS OF CURRENT RESEARCH PROGRAMS IN THE REGION, AND TO FURTHER REFINE CURRENT LEGISLATION BY TAKING INTO CONSIDERATION THE VIEWS PRESENTED TODAY. I AM PLEASED THAT WE WILL HEAR TESTIMONY FROM A WIDE RANGE OF GROUPS, INCLUDING STATE GOVERNMENT, THE FISHING INDUSTRY, AND ENVIRONMENTALISTS.

THE EVENTS OF THE PAST YEAR AND A HALF HAVE FOCUSED THE PUBLIC'S ATTENTION ON MARINE POLLUTION. WE HAVE HAD BEACH CLOSINGS IN NEW YORK AND NEW JERSEY, OIL SPILLS IN ALASKA, RHODE ISLAND, AND TEXAS, AND FISH KILLS IN THE GULF OF MEXICO. ALL THESE EVENTS HAVE ANGERED CITIZENS EVERYWHERE. WE IN MAINE HAVE BEEN FORTUNATE IN THAT THESE EVENTS HAVE NOT AFFECTED OUR STATE.

BUT WE CANNOT REMAIN COMPLACENT. WE ARE ALL AWARE OF THE IMPORTANCE OF A HEALTHY MARINE ENVIRONMENT TO MAINE'S ECONOMY, IN TERMS OF BOTH FISHING AND TOURISM. WE MUST TAKE STEPS TO PRESERVE THE COASTAL AREAS OF MAINE, WHICH ARE PRECIOUS AND VALUABLE STATE RESOURCES. MOREOVER, WE MUST REMEMBER THAT THERE IS SOMETHING OF GREATER IMPORT AT STAKE HERE: THE HEALTH OF OUR CHILDREN AND OURSELVES.

ALREADY THE DANGER SIGNS ARE HERE: NATIONAL OCEANIC AND ATMOSPHERIC ASSOCIATION FIGURES TELL US THAT AT LEAST FIFTEEN PERCENT OF CASCO

BAY IS CLOSED TO SHELLFISHING BECAUSE OF POLLUTION (1). PORTLAND HARBOR HAS THE FOURTH-HIGHEST PCB LEVEL IN SEDIMENT IN ALL OF NEW ENGLAND (2). THE RESULTS OF NOAA'S "NATIONAL STATUS AND TRENDS PROGRAM" REVEAL A FRIGHTENING STATISTIC: FLOUNDER TAKEN FROM CASCO BAY CONTAIN THE HIGHEST LEVEL OF LEAD OF ANY SAMPLING SITE IN THE COUNTRY (3). ALMOST 2 YEARS AGO, A REPORT BY THE OFFICE OF TECHNOLOGY ASSESSMENT, ENTITLED "WASTES IN THE MARINE ENVIRONMENT," FOUND THAT THE HEALTH OF OUR MARINE ENVIRONMENT IS DECLINING AND WARNED THAT THIS TREND WOULD CONTINUE IF NO ACTION WAS TAKEN.

WE HAVE NOT TAKEN SUFFICIENT ACTION, AND THE WARNING SIGNS ARE CLEAR: WHAT THEY ARE TELLING US IS THAT WE NEED TO GREATLY EXPAND OUR KNOWLEDGE OF THE EXACT NATURE OF THE THREAT TO MAINE'S WATERS, AND THAT WE NEED TO ACT ON THAT KNOWLEDGE. IN RESPONSE TO THESE SIGNS I HAVE INTRODUCED LEGISLATION WHICH WILL INCREASE OUR KNOWLEDGE OF THE PROBLEM, AND ENHANCE OUR ABILITY TO DEAL WITH IT.

ON MARCH 15TH OF THIS YEAR I HAD THE HONOR OF SUPPORTING SENATOR MITCHELL'S ENVIRONMENTAL EFFORTS BY INTRODUCING THE HOUSE VERSION OF THE MARINE RESEARCH ACT OF 1989. THIS MEASURE WOULD PROVIDE FOR COMPREHENSIVE MARINE ENVIRONMENTAL ASSESSMENT AND MONITORING. THE ACT IDENTIFIES 11 NATIONAL MARINE REGIONS, AND ESTABLISHES CORRESPONDING REGIONAL RESEARCH PROGRAMS. EACH PROGRAM WOULD DRAW ON UNIVERSITIES, STATE AGENCIES, AND PRIVATE RESEARCH FACILITIES, AND WOULD COORDINATE AND SUPPORT MARINE RESEARCH AT THE REGIONAL LEVEL. FOR EXAMPLE, HERE IN MAINE SUCH A PROGRAM MIGHT INCLUDE THE UNIVERSITY OF MAINE, THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND PRIVATE CONCERNS SUCH AS BIGELOW LABORATORIES.

GROUPS WITH A VITAL INTEREST IN SUCH RESEARCH, SUCH AS THE FISHING

INDUSTRY AND ENVIRONMENTAL ORGANIZATIONS, WOULD HAVE AN ACTIVE ROLE AS MEMBERS OF REGIONAL ADVISORY GROUPS. IN THIS AREA, FISHERMAN'S GROUPS MIGHT INCLUDE THE MAINE LOBSTERMAN'S ASSOCIATION AND THE ASSOCIATED FISHERIES OF MAINE, AND ENVIRONMENTAL GROUPS MIGHT INCLUDE THE NATURAL RESOURCES COUNCIL OF MAINE AND LOCAL CHAPTERS OF GROUPS LIKE THE AUDUBON SOCIETY. THE FEDERAL GOVERNMENT'S ROLE WOULD BE OVERSIGHT AND COORDINATION THROUGH A BOARD OF REPRESENTATIVES OF CONCERNED FEDERAL AGENCIES, SUCH AS NOAA AND THE EPA. IN ESSENCE, THE PURPOSE OF THE ACT WOULD BE TO START A CONCENTRATED AND COORDINATED RESEARCH EFFORT TO DISCOVER THE EXACT STATE OF OUR NATION'S, AND MAINE'S, COASTAL WATERS.

EACH REGIONAL RESEARCH PROGRAM WOULD RECEIVE $3 MILLION PER YEAR, TO BE FUNDED BY THE CURRENT 3-CENT PER BARREL FEE CHARGED ON FOREIGN-PRODUCED OIL. THIS FEE IS CURRENTLY BEING USED TO BUILD UP THE OFFSHORE OIL POLLUTION COMPENSATION FUND, WHICH WILL BE CAPPED WITHIN THREE YEARS. AFTER THIS FUND IS CAPPED, THIS FEE COULD PROVIDE FROM $25 TO $35 MILLION A YEAR FOR VITAL MARINE RESEARCH.

I HAVE ALSO INTRODUCED HR 1189, A BILL WHICH WOULD INCLUDE CASCO BAY IN THE NATIONAL ESTUARY PROGRAM OF THE CLEAN WATER ACT. THIS MEASURE WOULD PROVIDE FEDERAL FUNDS FOR PERIODIC CONFERENCES AMONG LOCAL, STATE, AND FEDERAL AGENCIES, ALLOWING THEM TO COORDINATE THEIR RESEARCH EFFORTS IN THE CASCO BAY REGION.

DURING THIS NEXT SESSION OF CONGRESS IT IS MY INTENT TO WORK CLOSELY WITH SENATOR MITCHELL AND THE REST OF THE MAINE DELEGATION, AND WITH MY COLLEAGUES ON THE COMMITTEE ON MERCHANT MARINE AND FISHERIES, TO PRODUCE LEGISLATION WHICH WILL HELP US BEGIN TO REVERSE THE DAMAGE WHICH WE HAVE DONE TO OUR OVERBURDENED OCEANS.

UNIVERSITY OF MAINE

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TESTIMONY OF DR. GREGORY N. BROWN
VICE PRESIDENT FOR RESEARCH AND PUBLIC SERVICE
ON BEHALF OF THE UNIVERSITY OF MAINE
BEFORE THE UNITED STATES SENATE
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
PORTLAND, MAINE
August 11, 1989

Chairman Mitchell, Members of the Subcommittee on Environmental Protection, my name is Gregory Brown, Vice President for Research and Public Service at the University of Maine.

The Gulf of Maine and its many ties with the people of the State and the Northeast represent a gift which we and our forebears have benefited from and enjoyed for hundreds of years.

The Gulf is the nexus among many individuals--members of the fisheries industries, people who live on or near the coast and depend upon it for their livelihoods directly or indirectly, those who experience its aesthetic qualities, and those who utilize its recreational potential. It provides millions of tons of fish, shellfish and other profitable commodities. It accommodates uncountable people with weeks of pleasure and beauty. However, the marine environment is not infinite. It is a gift with limits. As with any gift, there is an obligation, an obligation to conduct human affairs in such a way as to nurture the marine environment and provide clear barriers to acting in a manner deleterious to its current and future health.

There are stirrings in the Gulf of Maine which may indicate that we are overburdening that resource--that human activities are placing stresses on what may have been viewed as an endless capacity to disperse and hide the disintegration caused by human misuse.

Signs are evident which indicate that development along coastal margins can change the marine environment to a degree greater than society will find acceptable, especially if that development interferes with the natural rhythms of the ecosystem. We have signs that coastal erosion and what it contributes to the healthy cycle of salt marshes is probably critical to the lives of many marine organisms, including lobsters, shrimp, and some fishes which use these areas as habitats when very young. We have seen the actual landings of the finfish catch decline appreciably during the last year. We have cooperated in coastal cleanups overtly demonstrating the tons of solid waste which are dumped into and near our marine environment, and we have found some of the consequently dead and dying sea animals. We have been witnesses to the beginnings of decline.

Simultaneously with indications that the Gulf of Maine is not immune to the ravages of unchecked use and abuse, however, is the awareness that we have the grace of some time to plan. If we are able to use this grace period sensibly and well, we may be able to avert crisis management policies in the Gulf of Maine.

Averting crisis requires protection of the marine environment, and protection entails management policies. The viability and efficiency of management policies depends on the bases of their principles:

> Are they derived from informed opinion?
> Are they based on short-term or telescoped events?
> Have they a foundation in repeatable, demonstrable fact?

A critical source of information for management policies, which will work and work well, is a scientific consensus of research results.

The University of Maine is currently involved in strong research programs in areas of aquaculture, marine biology, marine geology, fish biology, fish pathology, seaweed biology, marine resource development, ocean engineering and socioeconomic and legal aspects of marine resources. Some research programs are carried out exclusively by University personnel; many programs are pursued in cooperation with other institutions, agencies and individuals.

The University of Maine Sea Grant College Program, administered in partnership with the University of New Hampshire, conducts a variety of research and outreach projects ranging from socioeconomic studies to scientific topics. The results of research projects are disseminated to user-groups through a series of built-in mechanisms and through statewide (and nationwide where applicable) Cooperative Extension activities.

Similarly, information generated through Maine Lobster Institute activities is used to help conserve that resource and insure the continuance of this marine industry. Working through a Board of Directors with industry representatives, the Institute identifies practical problems of concern and seeks solutions. The University's Fisheries and Aquaculture Research Group operates in a parallel fashion providing quick research solutions to specific marine fishery problems.

In a wider area, the Marine Advisory Program is a network of organizations working together toward the common goal of promoting the wise use, development, and conservation of northern New England's coastal and marine resources through research-based educational programs. By integrating the talents and resources of a variety of educational institutions and government agencies, it extends the impact of its programs and responds effectively to the needs of those dependent on marine resources.

Through interfaces with user-groups of research results such as these, through linkages with State agencies such as the Maine Science and Technology Commission sponsored Center for Innovation in Aquaculture, and through multi-institutional alliances such as membership in ARGO-Maine, the University serves to conduct marine research and bring the results to people who need them.

Most of the preceding activities consist of interfaces with groups or agencies which work to bring research results to user-groups through a technology transfer mechanism. Easily forgotten and often overlooked is the critical role of basic scientific research. Two reasons apply here:

--Without basic scientific research from which to extrapolate answers to particular problems, there is a greatly reduced source of solutions to those problems; and

--Basic research provides the integrated, overall image of the ecosystem, the total marine environment, which short-term solutions can impact.

We must be very wary of introducing a solution which becomes a greater problem than what it was intended to solve.

Scientific research can provide the foundation for marine protection policy, and while we currently have some knowledge contributing to our understanding of the Gulf of Maine, there are enormous gaps in this understanding, gaps which can only be filled by information gained from long-term studies directed to the complete picture of the marine environment. To be effective, this research must not confine itself to small portions of the coast. It will work best and produce the most if it is conducted on a regionally integrated basis.

Regionally integrated basic research is coherent, cost-effective, and conducive to communication. It has a built-in payback quality because it addresses the need to gain understanding of oceanographically coherent portions of the marine environment, it enhances multiple use of expensive equipment, it reduces unrequired duplication of effort, and it contributes to communication and information sharing among scientists involved in studies to answer common questions.

In short, protection of our marine environment requires management policy, and to be effective, management policy must be based on a consensus of solid, carefully reviewed scientific research.

The University of Maine recognizes and supports extended research and vigorous monitoring in coastal oceans, and it is overtly willing to contribute research effort to the task. Toward this end, the University of Maine has committed itself to establishing an Oceanography Department and recruiting scientists capable of participating in regionally integrated research.

The University's support for enhanced ocean research and monitoring is strong. It is, however, tempered with two caveats:

--It would be unfortunate to see regional research and ocean monitoring diminish the already limited research funding available; and

--It would also be unfortunate if implementation did not build on and use existing administrative and intellectual bases.

The University of Maine believes that through effective use and support of current institutions, more research effort and resources can be dedicated to addressing and conducting regionally integrated research in the Gulf of Maine.

The use of extant administrative mechanisms will preclude an additional bureaucratic layer between researchers and the funding needed to conduct regionally integrated research. It will make it easier to plan and coordinate research, ensure its relevance, and promote strong peer review.

The infrastructure to participate in large, regionally integrated long-term, multidisciplinary and multi-institutional efforts of basic oceanographic research is in place in Maine.

Already in existence are adequate administrative centers for this research, as well as a large base of expertise available to perform the research needed. What is lacking is appropriate long-term funding for this research.

The University of Maine is prepared to work actively with other institutions, agencies, groups, and individuals to support legislation nurturing research and monitoring of the Gulf of Maine.

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TESTIMONY

OF THE

NATURAL RESOURCES COUNCIL OF MAINE

ON MARINE PROTECTION LEGISLATION

Before
The Committee on Environment and Public Works
United States Senate
Portland, Maine

August 11, 1989

Presented by

Ronald A. Kreisman, Esq.
General Counsel, NRCM

Senator Mitchell, thank you for providing the Natural Resources Council of Maine ("NRCM") the opportunity to testify today on these important environmental initiatives.

The Natural Resources Council is a 7,000-member non-profit environmental advocacy organization. Over the last several years, the Council, like other organizations, has become increasingly involved in coastal pollution issues, as we have come to recognize the vulnerability of our coastal waters and the marine life which they support, and the degradation which is occurring on Maine's 3,000-mile coastline.

Two years ago and again this year, working closely with concerned state legislators like Representative Coles, the state DEP, the Maine Audubon Society, and a number of interested citizens, the Council was successful in having legislation adopted that prohibited any new private discharges to coastal waters, and required significant cutbacks in the 3,000 discharges which already exist in Maine that are having a significant and detrimental impact to Maine's shellfishing resources. In addition, the Council has worked with local citizen groups who are seeking improvements in the discharges from municipal treatment plants on the coast in order to reopen shellfishing areas and protect the marine environment from certain toxic impacts associated with these treatment plants. In addition, we are continually working to provide greater protection for coastal wetlands, and just last year the

Council spearheaded successful legislative efforts to manage growth in Maine, recognizing the rampant and uncontrolled development being experienced on Maine's coastline, and the effects of this development on marine resources and water quality.

My testimony before you today will focus primarily on Senate Bill 1178, the Marine Protection Act of 1989, which you have introduced. While the Council certainly supports additional funds for marine research, and believes that there is a critical absence of data available on a number of marine pollution issues in Maine, my comments are intended to focus on the regulatory aspects of Senate Bill 1178.

I would like to make a few general points and then turn to some of the specific provisions of the legislation. First, the Council very strongly believes that there is a need for significant and decisive action at federal level, through additional federal legislation, if we are to begin to get a handle on coastal pollution problems and take meaningful steps to resolve them. While states, and particularly the state agencies in Maine, must have a central role in any coastal pollution clean-up program, the Council's experience over the last several years is that the state's efforts on water pollution control matters have not focused on coastal waters, except in a reactive way. Instead, the initiative has come from third parties, either in the form of legislation or litigation. Until recently, Maine's Department of Environmental Protection had no staff person, and then one staff person, who was devoted to coastal water pollution issues. Further, the state lacks any specialized water quality criteria for coastal waters, and performs little pre-permit testing, if any, before licensing coastal point source discharges. Municipal treatment plants continue to cause closures of a very large amount of shellfishing habitat, while the chlorine toxicity which is associated with these coastal discharges and others has not been examined in any depth. The state is only beginning to focus on non-point coastal pollution as a result of the 1987 amendments to the Clean Water Act, and has very little data at this juncture on the scope of the problem, although national data shows that non-point pollution to coastal areas is a much more significant problem than point source pollution.

While the Council is hopeful that some aspects of the situation may be changing as state government and groups like the Council focus more and more on coastal pollution issues, we nonetheless feel that it is critical for the federal government to press this issue. Congress must exert firm leadership and establish clear directives if problems like combined sewer overflows and the destructive land use activities on the coast are to be addressed.

The second general point I would like to make concerns everyone's least favorite subject--the issue of funding for this program and the apparent disinclination to provide significant additional funding for some of the measures proposed in the legislation. For instance, while we are especially supportive of the requirements proposing additional deadlines on compliance for combined sewage overflows into marine waters, and while we believe that part of the solution to these combined sewage overflows, possibly a large part of the solution, need not entail huge outlays of funds, we remain quite concerned that states like Maine will not have enough money in their revolving loan programs to implement meaningful coastal cleanup programs, including correction of the CSO problem. The result of this, we feel, will be extensive delays in implementation of this program.

I would now like to turn to some of the major provisions of your bill, and give you the Council's reaction to them. In general, the Council believes that your legislation is an important step forward with several creative new initiatives. However, in several specific parts of the legislation we would urge you to take a more aggressive approach, given what we are discovering about coastal pollution problems, both in Maine and throughout the nation.

1. **Point Source Discharges.** The Council supports the basic premise of expanding the estuary program already in the Clean Water Act, so as to impose at the federal level a number of additional regulatory requirements on those water bodies experiencing a general degradation of environmental

conditions. In particular, the Council believes that the proposed requirements on new or expanded point source discharges in degraded waters, in which an "alternatives analysis" and offsets are required, are an excellent proposal.

However, the Council believes that this approach to point source discharges should be expanded beyond its proposed application to only designated national estuary waters. While we understand that it would probably be quite difficult politically to impose an offset policy on all coastal waters, at the same time we also know from our first-hand experience that there are precious few water bodies, especially in Maine, in which the data base even exists to justify a Section 320 designation, regardless of the actual degradation that the coastal waters may in fact be experiencing. This problem with the absence of data becomes especially acute given the additional absence of coastal water quality and sediment standards which could otherwise serve as a benchmark.

Because of this situation, the Council believes that the legislation should err on the side of presuming that the offset requirements will be imposed on all new or expanding coastal discharges unless the applicant can demonstrate that the degradation situation described in Section 320 is not occurring in the coastal receiving waters, based on sampling data, etc., regardless of whether the water body has received national estuary designation. Further, the Council strongly believes that the "alternatives analysis" should be required of all new or expanded discharges regardless of whether the water is a national estuary, and even regardless of whether the receiving water is otherwise meeting water quality and sediment standards (if they exist). We also believe that the specific language of the alternatives analysis requirement should be expanded so as to clearly direct all applicants for new or expanded discharges to demonstrate that, in addition to "waste minimization practices and technologies" alternative sites for waste disposal are not available. The applicant should also be required to demonstrate that the discharge is necessary to provide important economic or social benefits to the state as is currently required under EPA's anti-degradation regulations.

2. Water Quality Criteria. The second point we would like to make concerns the required promulgation by EPA and adoption by the state of water quality standards for coastal waters. We feel that this provision is a very important aspect of this legislation and must not be weakened in any way, including the timetables for promulgation. Since the 1987 amendments to the Clean Water Act, the Council has been deeply involved in efforts to have Maine adopt federal water quality standards and implement these standards in permitting decisions. As a result of the 1987 amendments to

the Clean Water Act under Section 303, the Council was successful in convincing the DEP and Maine's Board of Environmental Protection just this past January to adopt EPA's water quality criteria, although several paper companies have filed suit attempting to overturn this regulation.

From this experience we have concluded that it is only with enforceable water quality standards in place for those chemicals that are found to affect the marine environment that we can ever really hope to regulate both point and non-point sources. Promulgation of these water quality standards is a job that the federal government must do. States, especially states like Maine, simply do not have the resources, and absent these resources (and therefore absent water quality criteria), Maine will continue to license discharges solely on the basis of best available technology, which is not going to solve the pollution problem. Toxic pollutants are not and will not be controlled to appropriate levels without water quality criteria.

3. **Combined Sewage Overflows.** The Council wholeheartedly supports those provisions in Senate Bill 1178 that are designed to set a firm timetable by which these CSO's are to be removed or controlled. In Maine, these CSO's account for a significant amount of the shellfish closures that the state is facing. However, as I mentioned earlier in my testimony, we are extremely concerned that the

failure to provide adequate funding for CSO removal, combined with provisions in the legislation which appear to waive imposition of these deadlines in cases of inadequate financial resources, will mean that the CSO problem is again not squarely faced. Further, if it is true that there are solutions available to some of the CSO situations which will not require huge expenditures of outlays, but which will instead rely on land use management or conservation programs, then the bill should set up a series of financial incentives for municipalities to implement these programs and save money. Without such an incentive program, the Council does not anticipate that less costly solutions will be explored by the municipalities.

4. **Non-point Source Pollution.** Our final comment on the legislation addresses the proposed additional non-point source controls. First, we applaud the effort in the legislation to begin linking land use activities that cause non-point pollution problems to a licensing process--in this case, a Section 401 certification. It cannot be repeated enough that non-point source pollution from inappropriate land use development and agricultural practices is a major coastal-pollution problem.

Because the Council is quite skeptical of whether Section 319, the non-point controls enacted in 1987, is going to work because of its lack of enforceability, we strongly support movement towards regulating non-point pollution through a licensing process. While linking 401 certification for flood insurance to that land use activity which constitutes "best management practices" under 319 is a new and important idea, because of both the limitations of coverage for federal flood insurance and the discretionary nature of the 401 certification process at the state level (the state has a choice of not even undertaking Section 401 certification process) the Council believes that the linkage between non-point source and licensing in the bill does not go far enough. States are free under this proposal to disregard Section 401 certification, or to enforce a management practice that should not constitute "best management practices" for which EPA has no oversight authority.

For this reason, we would urge you to give serious consideration to a number of proposals that we understand are being discussed in Congress which will more fully and comprehensively regulate non-point pollution in coastal waters through a formal, mandatory link between water quality impacts and all significant land use activities in the coastal zone. For instance, the Council would favor an approach that requires the Maine DEP to certify for local land use activities that any significant activity will not cause or contribute to violation of state water quality criteria in the coastal zone. While such an approach is certainly a major change in how land use decisions are now made, the Council believes that there really is no choice if non-point pollution is to be comprehensively attacked.

* * *

In closing, thank you again for the opportunity to comment on this important package of legislation.

Testimony of Dean C. Marriott

Commissioner, Maine Department of Environmental Protection

before the

Senate Subcommittee on Environmental Protection

Portland, Maine

August 11, 1989

Senator Mitchell, Representative Brennan, I am Dean Marriott, Commissioner of the Maine Department of Environmental Protection, here to comment on Senate bills 587, 1178, and 1179, and H. R. 1421, We consider this legislation extremely important to Maine and to the country.

Traditionally, marine environmental programs have lagged far behind other water quality programs. However, in the past several years, interest in and concern over the health of our marine waters has dramatically increased. In Maine, we are strongly committed to protecting this valuable resource. We have seen what can happen to beautiful, healthy marine waters. We won't let that happen here.

My remarks today will address the condition of Maine's coastal environment and our efforts to protect it. But because so much more can and should be done, I will also share an outline of Maine's priorities for expanded marine protection. This will provide an appropriate framework for my comments on the proposed legislation.

Overall, I would characterize Maine's coastal environment as "reasonably healthy." We feel we are in better shape than some of our neighbors to the south, but we do have problems. We have had to close shellfish beds. Last summer, seven of eight areas monitored for bacteria around greater Portland exceeded swimming standards. Our waters are not pristine.

These problems, so far, are very localized. The areas under greatest environmental stress appear to be associated with concentrated human activity--past and present. We look with concern at Casco Bay, Boothbay Harbor, Penobscot Bay, the Piscataqua River estuary, the Saco River estuary, and the area surrounding Cape Rosier and Blue Hill. Their problems may not be as severe as those in other areas of the country, but pollution is present and we must act aggresively to avoid uncontrollable damage.

We have the commitment and the initiative to do so. An example is our Agenda for Action for Casco Bay. Governor McKernan announced this in January 1989, proposing eight items for immediate action and eight more requiring long-term attention. The program combines monitoring and research with stricter licensing, stronger enforcement action, new legislation and broader educational efforts.

Specifically it calls for: nominating the Gulf of Maine as a Nationally Significant Estuary; declaring Casco Bay a Priority Waterbody for comprehensive action by all state agencies; strictly enforcing all waste discharge licenses held in the bay; reviewing and revising municipal and industrial discharge license monitoring requirements; requiring monitoring of stormwater and combined sewer overflows; reporting violations of water quality standards immediately to municipalities; assessing the present and potential economic value of uses within the bay; and preparing legislation requiring adequate pumpout facilities at marinas. These actions have all been completed.

Long-term activities currently under way include: identifying, ranking and treating sstormwater and combined sewer overflows; quantifying inputs of toxics, nutrients and bacteria; removing discharges conflicting with designated uses; preparing a comprehensive Casco Bay Watershed Plan; developing a public education program on the bay's environmental issues; reviewing and coordinating inter-agency management goals for the bay; expanding and improving the state's environmental data management system; and reviewing and revising as necessary the state's policies on snow dumps and the ocean disposal of dredge spoils.

This program is clearly significant. However, we need to know and do much more. As we plan for the future, we recognize that a major issue we will have to contend with is non point source pollution. Through stepped-up enforcement, legislative action and the development of a stronger technical support program for municipalities state-wide, we have gained better control over direct discharge. Now we need to look to controlling the runoff, the stormwater--those diffuse sources of pollution that contain heavy metals, pesticides, petroleum products as well as bacteria. They pose a major threat to our marine water quality, and we can't afford to be passive in its presence.

In addition to these toxics, we also need to address the threat of contamination by materials like chlorine, PCBs, PAHs, pesticides, dioxin and other organic compounds. It's already here. Flounder livers collected from Casco Bay contained the highest levels of lead of any in a national survey. Lead levels found in Boothbay Harbor crabs were the second highest found in the country. This week we found evidence of copper toxicity in mussels from Cape Rosier. Levels of PAHs (polynuclear aromatic hydrocarbons), which contain the known carcinogen benzo-a-pyrene, are high in Casco Bay sediment.

We clearly need to identify just how big a problem we have here and to attack it accordingly.

And to do that, we need knowledge, derived from solid research.

What we can build from now is skimpy at best. In 1988, the Maine legislature approved the creation of the Maine Environmental Monitoring Program to be conducted jointly by the state's Department of Environmental Protection and Department of Marine Resources. This is our only comprehensive program assessing the extent, sources and impact of toxic pollution along Maine's coast. Considering that we are trying to manage an extremely complex and variable system, it is not enough. We must conduct more research in order for our protection goals to be met.

First, however, we must secure stable funding. The ability of any research to address large questions requiring decades of investigation is directly proportionate to funding stability. Issues like global warming, trend analysis, biological community responses, the biological availability of toxic pollutants, and the development of comprehensive watershed mass balance equations require long-term commitments impossible to make without the assurance of stable funding. In Maine we have the institutions capable of doing the work --the University of Maine's Darling Center for Marine Research, the Bigelow Laboratory for Ocean Sciences, Bowdoin College, our own state agencies, and others. We need the dollars to support their efforts.

If we can rely on stable funding, we can build, expand and strengthen research and assessment programs for the overall protection and preservation of the Gulf of Maine. These projects will prove even more productive if we are able to share technologies and information with other states, and if we approach the Gulf as an integrated whole, rather than piece by piece, bay by bay. The Maine State Planning Office is currently involved in an cooperative effort with Massachusetts, New Hampshire and the Provinces of Nova Scotia and New Brunswick to do just that. We all recognize that the Gulf is a common resource of inestimable value and that a group commitment to its protection is imperative.

We need more visioning of this kind. Our programs should be designed to ensure that information is free-flowing, methods are standardized, and research is complimentary, not redundant or competitive. However we must have support at all levels of government for this to happen.

That support is also needed to expand protection programs in specific geographic aras, such as Casco Bay. Our statutes give us some of the tools we need, but these laws need to be enforced. They may also need to be revised, replaced or augmented by new programs. We can't chart the most effective course of action without more information. An inventory followed by a diagnostic-feasibility study would give us the framework for restoration/protection projects. And because our goal is protection rather than restoration, we need to get on with the necessary research now.

All of this should make it clear why we are in total agreement with the thrust of the proposed marine legislation. Specifically, S.587, the Marine Research Act of 1989, and its companion, H. R. 1421, offer a rare opportunity to advance research efforts. Their regional approach is an appropriate and necessary one, providing the chance to find the answers to key questions. Our one concern is that the various Boards and Advisory Groups appear heavily weighted toward federal or federally-sponsored agencies. We feel that a more direct vehicle for state and local representation should be established, allowing those most familiar with the problems and needs to direct research priorities.

S. 1178, the Marine Protection Act of 1989, is also in tune with Maine's commitment to marine environmental protection. In fact, we have already incorporated many of its elements in our state programs. We are particularly encouraged by the mention of sediment criteria development: this has long been a priority need but one that requires a longer research investment than any single state can provide. We also fully endorse the proposed management of contaminated dredge materials. Little has been done in this regard even though we all recognizie that environmentally irresponsible handling can place pollutants out of our reach and ability to clean up.

One suggestion we offer to improve S. 1178 is to broaden the qualifications for designation to the National Estuary Program (Section 320). We feel they should allow as yet undegraded estuaries of high ecological value to be eligible. A true protection program would contain requirements flexible enough to permit designation without regard to pollution. It appears that the current language would restrict participation to those estuaries with identified problems.

A second comment reflects our concern over combined sewer overflows. It appears that non-point pollution is addressed in this legislation by reference to Section 319, the Non-Point Source Control Program. This linkage is essential to have a meaningful pollution prevention program.

S. 1179, the Comprehensive Ocean Assessment and Strategy Act, similarly appears to be in agreement with Maine's goals. We see in it attention to non-point source pollution, combined sewer overflows and storm water discharges. It would facilitate the information sharing I have noted is so important to intensifying the impact of our research. And it would provide some means for the development and implementation of state management strategies and protection programs.

In conclusion, we are encouraged by the specifics included in the four bills regarding marine protection-- espceially the Marine Research Act of 1989. We are ready to offer any further assistance or information we can provide.

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TESTIMONY OF THE

MAINE AUDUBON SOCIETY

ON

MARINE PROTECTION LEGISLATION

Prepared for
U.S. Senate
Committee on Environment and Public Works

Field Hearing; Portland, ME

August 11, 1989

Nancy R. Papoulias

Senator Mitchell, my name is Nancy Papoulias. I am a staff attorney with the Maine Audubon Society. As you may know, Maine Audubon is a regional conservation organization representing over 7,000 members statewide. We are committed to protecting wildlife, the habitat that supports wildlife, and other natural resources including the marine environment. As a member of Maine Audubon's advocacy department, I have been exposed to a variety of Maine's marine pollution problems. Also, as a geologist with the U.S. Environmental Protection Agency for 6 years, I have an understanding of important marine issues nationwide.

In the past, we have all been particularly casual about our treatment of the oceans, perhaps because they appear so vast and conceal most everything that we dump into them, or perhaps it is the ocean's tidal changes, thought by many to flush away our pollution problems. However, in the past few years this philosophy has begun to change. We have awakened to the realities; closed beaches and shellfish beds, fish kills and algae blooms. Our seas, once thought to be limitless and inviolable, have shown that they are as vulnerable as land to a wide range of human uses and abuses. The time has come for all of us to recognize that the marine environment and its resources are much too precious to ignore any longer.

Existing and Future Problems

Shellfish and fisheries provide the most quantifiable example of how much we stand to lose by polluting the marine environment. According to a Maine Audubon Society study, more than a quarter of the State's 49,000 acres of mussel and clam flats are adversely affected by domestic sewage, and many of those acres are closed to all harvesting. This represents a loss to the economy totaling in the tens to hundreds of thousands dollars.

This particular summer has been especially difficult for many of Maine's fisherman. Vast areas have been closed to harvesting and some of those that remain open are experiencing over-harvesting. We all know that the waters off the coast of Maine provide the livelihood for many Mainers. The hardship to fishermen as a result of marine pollution is very disturbing, yet it is only one facet of the continuing degradation of our marine environment.

Maine waters are experiencing significant point source and non-point source pollution problems. Unfortunately, we don't know to what degree. As you know, hydrocarbons, trace metals, and synthetic organic contaminants have been found in the sediments of many embayments in the Gulf of Maine. Runoff, found to contain oil, heavy metals, nutrients, organic materials and pesticides is often discharged directly into the ocean or carried by rivers to be ultimately deposited in the estuarine and near-shore sediments of coastal waters.

Other non-point source pollutants are comprised of combustible products released into the atmosphere from smokestack gases, wood burning stoves, furnaces and vehicle exhausts. Soot particulates containing polycyclic aromatic hydrocarbons (PAHs), trace metals and other potentially toxic compounds are often transported downwind, eventually falling to earth into watersheds that funnel the contaminants back to coastal waters.

Point sources, although easier to locate than non-point sources of pollution, share a limited data base. Maine's marine ecosystem receives enormous amounts of pollution from sewage treatment plants, industrial discharge pipes and power plant cooling water discharges.

In an effort to eliminate one of the more serious sources of pollution, last year Maine Audubon developed legislation, which was unanimously adopted, prohibiting installation of new residential overboard discharge systems and requiring operators of existing systems to seek alternatives. Attempts to weaken this bill during this past session were unsuccessful. Rather, the bill was strengthened, making this legislation a tremendous victory for Maine's coastal waters but, admittedly, not the all encompassing solution. With municipal sewage treatment plants and combined sewer overflows throughout the state discharging vast quantities of effluent far beyond acceptable standards, our efforts to limit residential overboard discharges are only one step in the right direction.

Last month, Maine Audubon joined the Conservation Law Foundation and Island Institute in a law suit against the Portland Water District for violations of their federal and state sewage discharge permits and combined sewer overflow violations. We hope that this will send a message to other treatment facilities that Maine citizens will no longer tolerate plants operating in non-compliance of their discharge permits. Maine Audubon has begun an intensive investigation of municipal treatment plants statewide. Our preliminary data suggests that, of the 51 sewerage treatment facilities examined, 31 are in moderate to serious non-compliance.

Another primary cause of the degradation of marine waters is the increase in coastal development. Maine's coast is experiencing increased development at an alarming rate. With increased development comes an increase in impervious surfaces such as parking lots, driveways and structures. This eliminates the soil's natural filtering capacity, allowing runoff a more direct path to our waters. Increased development also results in growing volumes of sewage and garbage, as well as increases in sediment and nutrient runoff. All cause additional stresses to our coastal environment but again, the extent of pollution has not been quantified.

We cannot ignore growth projections - from 1950 to 1984, the population in coastal communities grew by more than 50%; by the year 1990, 75% of the Nation's population will live within 50 miles of the coast. Given the limited knowledge that we have with respect to the effects of building on near shore areas, how can we manage growth in a way to safeguard our marine environment? The protection of our coastal waters depends upon a thorough understanding of the impacts of coastal development, before development occurs.

Pending Legislation: S.587, S.1197, and S.1198

Maine Audubon strongly supports the three bills being discussed today and commends Senator Mitchell and Committee members for their concern of our marine environment. It is evident that Maine is experiencing considerable population growth, mounting development pressures and increasing marine pollution. It is essential that research into the sources of pollution of Maine's waters and their impacts on the marine environment be conducted before further degradation occurs. If we are to effectively protect the marine environment, we must first develop a through scientific understanding of this valuable resource. The legislation being discussed today will provide for long term research and management commitments, which will provide the foundation for protecting our waters.

Specifically:

* We strongly endorse the concept of regionally focused research programs as provided for in the Marine Research Act. The establishment of ten, multi-state, regional marine research centers is the best approach to investigate the unique problems existing across the nation. We are especially pleased that this bill proposes to utilize existing programs. This is an ideal blend, a program focussed on regional issues, utilizing local expertise, yet guided by oversight on a national level. This would, of course, eliminate duplication of research, provide for much needed coordination of efforts and allow for a more effective and efficient utilization of funds. Since a state is most familiar to problems endemic to that particular region, it is appropriate that state and local organizations be funded and given the responsibility to set their own agendas.

* S. 1178 and S. 1179 call for research and monitoring programs which require long-term monitoring of pollutant concentrations, marine ecology and other physical and biological parameters; ecosystem assessment programs; comprehensive water quality and sediment monitoring; assessment of nutrients, sediments and pollutants in designated water bodies; and a review and analysis of available environmental data. The theme of my remarks thus far has been that data is lacking and this type of research is pivotal to understanding the condition of the marine environment.

We are also pleased that research and monitoring programs would be established for atmospheric pollutants, floatables, algal blooms, health impacts and economic impacts. Atmospheric pollutants, marine plastics and algal blooms are all problems in the state of Maine. These areas must be investigated.

* Given Maine Audubon's concern with sewage treatment related problems, we praise the proposed phase out of combined sewer overflows (CSOs). The federal government has been slow in developing and enforcing strong CSO policy. The proposed legislation calls for an innovative approach for eliminating CSOs. Traditional approaches to controlling these discharges, such as separating stormwater or building for greater capacity have been costly and shown to have little effect in eliminating pollution from receiving water. We suggest examining economic incentives for the elimination of stormwater. For example, rate structure adjustments could be provided to those users who utilize innovative approaches in treating stormwater.

* We believe that the National Estuary Program (NEP) will be improved by the proposed legislation. At present, NEP's funding levels are low and critics claim that the program suffers from lack of leadership and authority. This legislation would provide additional funds and give greater authority to the Administrator to take action. With the program presently in place, we are troubled by the five year gap from the time a water body becomes designated until the

time clean-up begins. This legislation would allow for quicker action. Once water bodies have been designated, the Administrator is required to convene a management conference and to, among other things, assess trends in water quality and develop a comprehensive environmental protection plan recommending priority corrective actions and compliance schedules. The special authorities given to the Administrator with respect to enforcing more stringent coastal discharge standards are the type of actions needed for a more expedient restoration period. Maine Audubon supports the strengthening of this program as proposed.

* The proposed bills call for the development of much needed water quality criteria and standards for the marine environment. We believe that this is a very significant part of the legislation. To obtain improvements in water quality, it is essential to have enforceable standards. States have been slow in adopting marine water quality standards and many still have no such standards. Most often, focus has been on fresh water environments rather than marine environments. Along with standards for priority pollutants, we are pleased to see the inclusion of sediment criteria and biological criteria since they are important parameters in evaluating marine environmental conditions.

Since marine waters are so transient, and are vulnerable to contamination from different states, we support the development of federal water quality standards. Minimum federal standards allow states to set more stringent standards if they find it appropriate. Federal standards would allow for more consistent enforcement and could make for more expeditious adoption.

* We support the level of funding associated with this legislation at a minimum level. To seriously undertake a program of this magnitude, significant funding is necessary. There is no doubt that the cost to clean up our environment is far greater than measures to prevent pollution. As we have seen in other states experiencing water pollution problems, the cost of restoration is staggering. In the past, our society has responded to environmental crises, not anticipated and prevented them. Reactivity is very costly both economically and environmentally. Our coastal waters are in trouble and further complacency will be costly and dangerous.

It should also be recognized that the State of Maine is making a considerable contribution to the investigation of marine pollution and has this year tripled its efforts in marine monitoring. This should be seen as an indicator of the seriousness of this problem and a commitment on the part of our State.

* Lastly, the disposal of contaminated dredged material poses a problem in our state. Usually, little is known with respect to the content of the dredged spoils. There are a number of proposed dredging projects presently before DEP for review, including proposals to dredge areas in Casco

Bay. Indications are that there are significant amounts of dangerous contaminants in many of our embayments. Without identification and management of contaminated sediments, as called for in S.1178, sound decisions regarding dredging procedures and disposal of spoils is impossible. We support the provisions set forth in this section. However, we believe that ocean disposal permits should be carefully considered and alternative disposal methods explored for materials containing contaminates far exceeding sediment quality standards.

We thank you for the opportunity to present our views.

Testimony before the Committee on Environment and Public Works
Subcommittee on Environmental Protection in Portland Maine
August 11, 1989

Thank you for inviting me to testify before the Subcommittee on Environmental Protection today. I am Barbara Stevenson. I live in Auburn, Maine and own two offshore fishing vessels. I was a member of the Mid-Atlantic Fishery Management Council for six years, and have been on the board of both the Mid-Atlantic Fishery Development Foundation, and the New England Fishery Development Association. I am currently the Government Relation Liaison for Associated Fisheries of Maine. I am speaking today primarily as a vessel owner. I will first make some general comments concerning pollution and fishermen and then will comment specifically on S.587.

Water quality affects fishermen directly and daily. While ocean dumping might be one of the more obvious examples, the quality of water in our marshes, rivers, and bays may have an even more significant effect on our fishery resources. As an owner of two offshore fishing vesseis, my livelyhood depends on a healthy environment for a multitude of fish species through all stages of the fish's lifecycle. It does me no good for the water in the Gulf of Maine and Georges Bank where I fish to be healthy if the nursery areas preclude fish from ever growing to harvestable size. It also does me no good if pollution on Georges Bank (for instance that caused by oil operations) or in the offshore waters of the Gulf of Maine eliminates the fish my boats catch or the fish the fish my boats catch feed on or the plankton the fish that the fish my boats catch feed on is eliminated.

Not only do the fish have to live, but they themselves must be healthy. I can't sell fish with obvious cancers or fin rot.

Beyond that, I am dependent on the public's perception of water qualtiy. If the public thinks my fish came from a cesspool they will not purchase fish, no matter how clean the enviornment actually is. Last summer's nightmare of an almost daily assault of medical wastes on the beaches and other marine enviornment problems depressed demand for fish in general, adversely affecting us in Maine even though none of the incidences were in the Gulf of Maine.

I support legislation directed at improving marine and coastal water quality including legislation to assure that marine ecosystems do not need to degrade to a crisic state before action is contemplated. But please remember it is also important to fishermen that in any push to improve the environment, the public not get false negative impressions as to the quality of our product.

Another concern fishermen and fish processors have when discussions of water quality arrise is that all sources of discharge are not equally detrimental. Fish processing wastes should not be equated to toxic chemicals, medical wastes, or even household sewage. We have also seen time and time again that broad based solutions, such as clorinating any discharge no matter what the content, can do more harm than good. In Maryland, where we frequently sold our fish prior to moving to Maine, the seawater used to wash the ice off of the fish had to be clorinated before it could be discharged overboard. The crabs and small fish disappeared. The docks began removing the clorine tablets from this discharge - but not from other discharges - and fish and crabs abounded again.

I agree with the concept of coordination in basic research and in viewing ecosystems rather than individual problems as addressed in S.587 but I have some concerns with the specifics of the bill. Requiring all projects funded under S.587, the National Sea Grant Program, Section 320 of the Federal Water Pollution Control Act, the Fish and Wildlife Act of 1956, and The Magnuson Fishery Conservation and Management Act of 1976, be included in the three-year research plan would eliminate any chance Fishery Management Councils now have to get desperately needed research into whatever presently unknown but important situation that next occurs. The bill needs to specify that it addresses only basic research excluding (except for information) applied fishery and/or management research.

Finally, I wish to take this opportunity to urge acceptance of variability in fishery stocks as a given. Fish stocks are dependent on such environmental factors as wind and temperature, which we cannot control, as well as environmental factors such as pollution which we must control. We cannot force ecosystems to produce what we deem they should. We can assure wise utilization of what ecosystems do produce.

Testimony of

Dr. Dennis L. Taylor, Director
Bigelow Laboratory for Ocean Sciences
West Boothbay Harbor, Maine 04575

Before the U.S. Senate Subcommittee on the Environment and Public Works

August 11, 1989
Portland, Maine

Thank you for the opportunity to testify and offer support for S.587, The Marine Research Act of 1989, S.1178, The Marine Protection Act of 1989, and S.1179, The Comprehensive Ocean Assessment and Strategy (COAST) Act of 1989. The scientists of the Bigelow Laboratory strongly support passage of these three bills, because (a) they serve (most importantly) to direct attention to the urgent need for basic ecosystem-oriented research in coastal oceanographic processes, including the land margin interface, and (b) they focus resources on the tripartite needs of research, assessment and monitoring within the coastal oceans, with a view to the wise use and stewardship of these natural environments, and the natural resources contained within them. For the Gulf of Maine, they offer a timely course of action to meet growing and diverse pressures impacting this valuable and important coastal sea.

The following comments respond to the general questions raised by the Committee, and represent the views of both myself and other scientists at the Bigelow Laboratory. They also include some practical observations on the evolution and requirements of regionally based programs of environmental research made during my tenure as a researcher and Laboratory Director in the Chesapeake Bay region. I hope these will be useful to the Committee.

1. What are the existing environmental conditions in the Gulf of Maine and what are expected future trends in these conditions?

2. Is there evidence that specific coastal areas, such as Casco Bay, are under greater environmental stress than marine and coastal waters more generally?

One's view of the status of the Gulf of Maine ecosystem is clearly influenced by the perspective taken. Because the Gulf is a large, well mixed body of water, its offshore areas and deeper basins are relatively clean, and exhibit minimal effects of pollutants. However, nearshore coastal areas are impacted relative to population densities, and the general trends exhibited Gulf-wide suggest that contaminants are air borne as well as water borne. One example being the atmospheric as well as aquatic dispersal patterns of PCBs and other pollutants traceable to the area of Boston Harbor. These data suggest we have paid too little attention to a holistic ecosystem view that includes the air/land/water continuum. Total drainage basin perspectives that include an atmospheric component are important.

Nearshore, there is evidence that the coastal marine environment of the Gulf of Maine is significantly degraded. This includes areas of low population densities as well as the more obvious embayments near large urban centers. Boston Harbor, Massachusetts Bay, Casco Bay, Penobscot Bay and others exhibit levels of pollution and degraded water quality that are among the worst reported nationwide. In these areas, as well as coastal areas generally, reduced rates of flushing (in concert with already high levels of natural productivity) combine to diminish the capacity of these systems to assimilate anthropogenic inputs; thereby leaving them vulnerable to progressive degradation and, in worst cases, in urgent need of rehabilitative actions.

As the nearshore degrades, it will progressively impact the offshore, deeper basin, further exacerbating a potentially unmanageable situation in this semi-enclosed coastal sea. Without specific, corrective action guided by state-of-the-art research, the central question will revolve around the assimilative capacities of the Gulf as a whole and a decision with regard to acceptability. My assumption is that current trends are unacceptable.

The assimilative capacity of the Gulf of Maine's coastal and shelf waters is a subject of considerable speculation. Though its waters appear to be replaced by mixing with Atlantic waters on average once a year, there are sites in the deep basins that accumulate sediments (and their accompanying toxic loads) relatively rapidly. The nature of the mechanisms controlling the fate of pollutants entering coastal waters is a complicated mix of naturally variable biological processes interacting with equally variable current systems. Such a condition makes it extremely difficult to construct meaningful predictive models that could lead to a functional understanding of the biological, chemical and physical regime defining assimilative capacity. Field work by Bigelow Laboratory scientists and colleagues at other institutions in recent years demonstrates the complexity of processes operating in shelf waters. This work underscores the need to encourage multidisciplinary approaches in larger, regionally focussed, long range monitoring and research. For example, the main current systems of the Gulf are driven by the density contrasts between fresher coastal waters and the episodic influxes of dense Atlantic waters at depth. These currents deliver naturally high nutrient concentrations, contributing to the Gulf's rich biological productivity, while simultaneously mixing and dispersing anthropogenic pollutants. At present, we still do not sufficiently understand the processes that produce large fluctuations in the magnitude, speed and direction of these currents. During a research cruise this past summer, we were surprised to observe that the Gulf's major coastal current system had been extended nearly 100 miles further to the west than we had previously predicted. While the reasons are unclear, it serves to underscore our weak understanding of factors driving the major circulation of the Gulf.

Management strategies to protect and preserve living marine resources are seriously hampered by our lack of understanding of these processes. In the context of declining fish landings in the Gulf of Maine and U.S. Continental seas generally, these uncertainties make fisheries management strategies difficult if not impossible to formulate and defend.

Finally, if all of these trends and uncertainties are viewed against the backdrop of any of several predicted scenarios resulting from global warming and concurrent sea level rise, the future for the Gulf of Maine appears precarious indeed. Only modest increases in sea level resulting from the melting of polar ice and the thermal expansion of seawater would dramatically impact tidal range and current systems in the Gulf. How such changes might impact overall circulation and transport are unknown, as is the fate of the biologically important Gulf of Maine intermediate water. Both biological productivity and assimilative capacities would be dramatically altered.

3. What is the status of existing programs for research, monitoring and assessment of environmental conditions in the Gulf?

Two principal sources of funding come to bear on research in the Gulf of Maine. The smallest and most directed coming as applied research issues promulgated and supported by State and local government. Because of its nature and limitations it actually does little to advance a holistic, planned approach to research in the Gulf ecosystem.

Federal research support has quite the opposite character, with the perspective that regional scientific issues such as those posited within the

Gulf of Maine are often too parochial to warrant support in the context of peer review. While I disagree with this view, -good science should be the issue- I do recognize it as a well established fact of life. This is true despite the fact that the Gulf of Maine is an intrinsically interesting oceanographic entity whose understanding can contribute significantly to the broader knowledge of coastal ocean systems. Several recent symposia organized through ARGO-Maine and sponsored by ASLO/AGU and NOAA have served to successfully promote this view, and there is an increased interest in the basic scientific study of the Gulf.

Given the existing dichotomy of funding described here, much of what needs to be done on a regional basis falls "between two stools". Important lessons exist in the case histories of regions such as the Great Lakes and the Chesapeake Bay. Broader funding for research assessment and monitoring became possible simple because the problems crossed State and National boundaries, demanded a coordinated approach to planning, and were perceived to be of a scale that was justifiable as a national concern. The legislation proposed here (S.587, S.1178, S.1179) raises the entire U.S. coastal ocean and estuaries to the level of national concern. I am personally very encouraged by this.

Existing programs for research, monitoring and assessment in the Gulf are presently limited and appear to me at least, to be fractionated. The current Status and Trends program has only limited stations in the Gulf, and the earlier Ocean Pulse Study is nearly 10 years old. There may be others which my newness to Maine causes me to overlook, but they are not obvious. Given evidence that we are experiencing a continually degrading environment, there is an urgent need for a status assessment study. Other than the proposed legislation, there are no major efforts on the horizon.

4. **What steps are needed to expand and strengthen research and assessment programs for the Gulf of Maine?**

The most obvious answer is that the commitment of resources must be for a very long time, and it must have consistency and constancy. There is waste and often poor science that results from episodic and inflated financing. Environmental research requires a commitment in time. The resources must parallel that time commitment if they are to be effective.

The research should be coordinated and planned on a regional basis in a forum that brings scientists, managers, planners, economists and other citizens together. Scientists should be working scientists and should play a major role in peer review and planning. Peer review should draw upon the entire national oceanographic community as its resource to set standards for scientific quality.

New sources of support emphasizing regional needs need to be found. These proposed bills fit this requirement, but there should also be an effort to initiate and expand the general level of funding for research in the coastal ocean and estuaries. Here I would highlight the need to increase funding for the NSF program in Land Margin Ecosystem Research, (LMER). I would also suggest that Sea Grant as a complementary (not overlapping) programmatic activity be encouraged to increase programs in coastal and estuarine systems with emphasis on public extension and advisory services.

Organizations such as ARGO-Maine need to be encouraged and nurtured because of their important organizing and coordinating role for scientists working in the Gulf of Maine. Such efforts can work among scientists and institutions without the constraints of state or regional boundaries.

The public needs to become aware of the fact that all is not well in the Gulf of Maine, and neighboring states in the region must commit to programs

that match and expand Federal efforts to improve the environmental quality of the region. In this regard, the State of Maine has a major opportunity to support the expansion of coastal research efforts, including pertinent issues of global climate change by full participation in NSF/EPSCoR.

5. Is there a need to expand programs for the protection of water quality and for the control of water pollution in specific areas, such as Casco Bay, and for marine water more generally?

Without question, the need exists. However, water quality is only part of the problem, and it is both misleading and unwise to emphasize water quality issues in isolation from other related, synergistic issues. If there is a rationale for the ten marine research regions designated, it is not geopolitical but watershed based. Research in the Gulf of Maine must consider the entire system of watershed, estuary/ocean and atmosphere if it is to correctly identify rehabilitative strategies. Water quality is only one measure whose effectiveness and value will vary with the system considered. For the Gulf of Maine where tidal mixing and flushing provide a rapid exchange of waters, water quality may never adequately serve as an early warning of problems. Sediment quality and bioaccumulations in benthic organisms often tell a radically different story. Viewed from this perspective, Casco Bay, Penobscot Bay, the Kennebec and other coastal areas are seen to be among the most impacted in the nation. As an example, studies of flounder livers reveal Casco Bay to be #1 in the East Coast with respect to lead, silver, zinc, and chromium. In New England, Casco Bay is #1 for seven of nine metals tested.

Water quality standards are now also matters of law not biology. As a result, the desire of Federal Agencies not to break the law, or to prevent others from breaking the law leads to peculiar rationalizations and strategies.

Most frequently, water quality is preserved by encouraging(?) the polluter to extend the time scale of loading while preserving the total load delivered. For a system where sediments and benthic organisms are key factors locking in pollutants, this is strategy for disaster.

Consider that the matter needs broader attention to standards.

6. What is your view of the proposed legislation to expand marine research and protection programs, and what changes would you suggest to improve proposed legislation?

As you are aware, I support the proposed legislation and believe strongly that it is an important first step to address the growing degradation of our coastal ecosystems. My experience elsewhere leads me to a number of general comments.

First, the funding of marine environmental research must not be conducted as if it were a chain letter. By this I mean you should avoid at all costs the establishment of a nested hierarchy of committee and agency responsibility for oversight and for the purpose of a financial conduit. This is wasteful and eventually serves to isolate the scientific community from the research decision making process. A study by the Chesapeake Research Consortium some years age suggested that of all the funds for the EPA Chesapeake Bay Program less than 35-40% could be identified with science. You should avoid that here.

Second, you should vigorously defend the notion of regional research planning councils. Peer review should be national in scope, but there should be a large amount of discretion on a regional basis with minimal Federal oversight.

Third, it is important to emphasize the need to support basic research. Here I would also note that I find little use for the distinction between basic and applied research generally, and particularly where our understanding of how coastal systems function is so restricted as to limit our ability to pose sensible applied questions. Monitoring, assessment and basic research go hand in hand. They must be interactive (dialectic) and complementary if they are to be useful and progressive.

Fourth, as I have indicated elsewhere, you should enhance other complementary efforts such as LMER where ever possible. I also support the notion of additional funding for Sea Grant as a separate but complementary matter. Sea Grant serves an important function and has a broader mission with respect to its constituency. However, I do not regard its activities as part of the main stream of ocean science and believe the majority of my colleagues would agree. Because of this view, I would not support a role for Sea Grant in primary direction at the Federal level. It is more appropriately involved at the regional council level.

Finally, I wish to call to your attention a factor which I have come to regard as an inherent flaw in the way our Nation goes about the business of environmental regulation and environmental protection. Congress may pass legislation and make law, but it is through litigation that these laws are given definition. Frequently, this process can take years while environmental degradation proceeds. Ofttimes the result makes little biological sense. We are perhaps unique in this regard, and while it is understandable in a Constitutional context, it is really a poor approach to the need for timely action to reverse and prevent progressive environmental collapse. I do not know the answer to this dilemma, but a recent study supported by private foundations in Maryland, known as the Coastal Seas Project, suggests that other nations are equipped to respond more directly and decisively than we. It is a broader issue, but one worth raising here.

Thank you for this opportunity to express my views. My newness to the Directorship of the Bigelow Laboratory and Maine causes these comments to be more generic in nature. For this I apologize. I do hope, however, they will be useful and thought provoking. In closing, let me offer my assistance and that of the Bigelow Laboratory's scientists, should you need us in the future.

Thank you.

STATE OF MAINE
113TH LEGISLATURE
SECOND REGULAR SESSION

FINAL REPORT OF THE COMMISSION ON MARINE RESEARCH

DECEMBER 1988

MEMBERS:
Rep. James Reed Coles, Chairman
Rep. Nathaniel J. Crowley, Sr.
Rep. James R. Handy
Rep. Theone F. Look
Rep. Omar P. Norton
Sen. Stephen C. Estes
Sen. John L. Tuttle

Staff:

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I. EXECUTIVE SUMMARY

A. Findings

The Marine Research Commission finds that:

1. The Gulf of Maine is a resource of tremendous importance to the State both ecologically and economically.

2. Resources in the Gulf of Maine are experiencing problems from both human-induced and natural changes.

3. We do not know enough about basic physical and biological systems in the nearshore waters and the Gulf of Maine to know how much stress they can tolerate, what effects further human alterations will have and what actions would best restore and protect them.

4. A variety of programs and institutions conduct marine research within the state funded primarily by the federal government. However, there are limited means to support coordinated research addressing problems of importance specifically to Maine. In addition, recent trends have shown a decline in marine research funding from federal sources.

5. Marine research institutions in the state have basic facility constraints that must be addressed to enable them to continue to carry out high caliber marine research in the Gulf of Maine.

6. The University of Maine System has a shockingly inadequate marine research program considering the importance of the coast and ocean to Maine. A special Task Force on Marine Activities within the University of Maine has urged the University to strengthen its activities and organization in the marine field. The changes and actions they suggest are much-needed to increase the effectiveness of the University in marine activities.

7. The Bureau of Marine Science within the Department of Marine Resources is partially supported by federal funds. Recent trends have shown a decline in federal funds: three federally funded positions were recently lost and 10 more positions within the Bureau remain vulnerable to further reductions in those funds. This dependence undermines the long-term consistency and stability needed for an effective research program.

8. The Bigelow Laboratory of Ocean Sciences is the largest private marine research organization in Maine, providing unique research capabilities important to Maine and attracting significant out-of-state funds and world-wide prestige to Maine. Yet lack of funds for basic institutional support and its dependence on temporary grant funding jeopardizes the future of its contribution to solving Maine's marine resource problems.

9. Basic and applied research are important to managing and understanding the dynamics of the Gulf of Maine, as well as managing the impacts of growth and pollution on the quality of Maine's marine environment. Mapping and monitoring programs undertaken by state agencies and private organizations provide vital information for these research efforts. Yet these programs are skimpy and poorly funded.

B. Recommendations

In response to these findings, the Commission has proposed legislation for introduction into the one hundred and fourteenth Legislature that will:

1. Create a Marine Research Board within the Maine Science and Technology Commission to identify high priority research needs within the state. The Board will develop and administer a grants program to fund projects designed to meet those needs.

2. Fund current federally funded positions within the Department of Marine Resource's Bureau of Marine Science from the General Fund to alleviate DMR's dependence on federal funds and stabilize these positions.

3. Fully fund the librarian and assistant librarian positions at DMR's McKown Point library. Half of each position is now paid for by Bigelow Laboratories for the Ocean Sciences. Full state funding would allow Bigelow's portion of this funding to be put toward the Laboratory's other critical needs.

C. Additional recommendations

In addition, the Marine Research Commission supports:

1. The current appropriation to Bigelow Laboratory and recommends that this appropriation be continued or expanded. The Commission also supports consideration of appropriations to other private organizations, for example the Mount Desert Island Biological Laboratory whose marine research missions are of importance to the state.

2. The University of Maine's Task Force on Marine Activities report to President Dale Lick. This report makes solid recommendations to upgrade the University's role and effectiveness in the field of marine research and that effort should be supported. Specifically, the Commission supports the recommendation stressing the importance of a state match for the Sea Grant College Program.

3. Marine mapping and monitoring programs undertaken by state and private organizations. While the bill proposed by the Commission is focused on basic and applied research, continued monitoring and mapping efforts within the Gulf are essential to understanding our marine environment and the Commission strongly recommends increasing state support for this activity.

II. INTRODUCTION

1. The Commission on Marine Research

In the second session of the one hundred and thirteenth Legislature, LD 2387 a "Resolve Creating the Commission on Marine Research" was introduced and referred to the Joint Standing Committee on Marine Resources. The committee reported out the bill Ought to Pass as Amended with Committee Amendment A (H- 617).

As reported out of Committee, the bill set up the Commission on Marine Research to do the following:

1. Identify the areas of marine-related research conducted at federal, state and private institutions and the level of support;

2. Outline the degree of cooperation and coordination between the various research institutions operating within the State;

3. Develop a compendium of research gaps and needs and solicit information, advice and recommendations for state-supported marine research; and

4. Develop recommendations for state actions and funding to support this policy and program.

In the final days of the second regular session, the bill was amended in the Senate (S-537) to strike out this language, leaving only the emergency preamble and an appropriation.

This report is a product of the deliberations of the Commission on Marine Research. Where possible, this report follows the intent of the bill as reported out of committee.

The commission held a public hearing in July and met several times over the summer and fall of 1988. A working group composed of marine researchers has developed a preliminary set of research needs to address in the Gulf of Maine. Three submissions are attached in appendix B.

2. Senator Mitchell's Bill

In the 100th Congress, Sen. George Mitchell introduced S. 2068, a bill to "Amend the Marine Protection, Research and Sanctuaries Act to Protect Marine and Near-Shore Coastal Waters through Establishment of Marine Research Centers". The purpose of the bill was to:

1. Expand and improve research and monitoring of marine and coastal waters to understand how these systems work and how human activities affect them;

2. Coordinate marine and coastal research at the regional level; and

3. Expand and support research at the regional level.

The bill proposed to establish 10 regional marine research programs and to develop comprehensive reports on the conditions, trends and needs in the marine environment. These programs were envisioned to set overall research goals for the region, develop comprehensive long range plans, monitor and report on environmental quality in the region, provide for public input into their activities, and coordinate research activities both within the region and with other regions. As proposed, the bill had an appropriation of $33 million from the Marine Research Trust Fund. While the bill was not passed during the 100th Congress, Senator Mitchell plans to reintroduce it in the next session.

The Gulf of Maine is one of the regions proposed within the bill. The creation of a Marine Research Board as proposed by the Commission, would position Maine to take a lead role in the Gulf's regional program.

III. FINDINGS

The Commission on Marine Research puts forth the following findings in support of proposed legislation:

1. The Gulf of Maine is a resource of tremendous importance to the State both ecologically and economically.

The rich resources of the Gulf of Maine provide habitat for fish, shellfish and wildlife, opportunities for aquaculture, an avenue for commerce and important recreational values.

In addition, preliminary estimates of Maine's marine industry indicate that it employs over 24,000 people with a value-added contribution of over $792 million to the state's economy or 4% of the Gross State Product. The aesthetic and recreational values of the coast, while not readily quantifiable, also contribute greatly to our economy and Maine's quality of life.

2. Resources in the Gulf of Maine are experiencing problems from both human-induced and natural changes.

There is a growing awareness and concern for environmental problems in the Gulf of Maine. Once thought to be a relatively pristine environment, reports of high levels of hydrocarbons and PCBs in Casco Bay paint a different picture. Nearly 30 million gallons of treated sewage and 22 million gallons of industrial wastewater flow into the Bay each day; 67 tons of toxic metals and 1500 tons of petroleum-related hydrocarbons end up in the bay each year. PAH (Polycyclic Aromatic Hydrocarbon) levels found in sediments from outer Casco Bay were the fourth highest in a nationwide study of bays and estuaries. Mussels from Casco Bay sampled in a national EPA survey contained levels of hydrocarbons that were the highest found in the Northeast.

Further up the coast, the appearance off Prince Edward Island of a lethal dinoflagellate bloom coupled with an unexplained plankton bloom in Maquoit Bay, which killed 40% of the organisms in the bay's flats, highlight the dearth of information on our resources and the intense need for more research.

Commercial fish landings are declining without a clear cause. Shellfish harvesting areas throughout the coast are closed because of bacterial pollution levels and the presence of toxins. While the values of the coast attract population and tourism growth, their presence increases contamination and related environmental problems in our coastal waters. Discharges from sewage treatment plants and disposal systems and run-off from urban areas and construction sites contribute to marine pollution.

3. We do not know enough about basic physical and biological systems in the nearshore waters and the Gulf of Maine to know how much stress they can tolerate, what effects further human alterations will have and what actions would best restore and protect them.

The ecological systems of the Gulf are complex and interrelated. The effects and magnitude of resource management decisions (land use or fisheries management for example) are not now predictable. We need to understand the dynamics of both the physical and biological resources of the Gulf if we are to manage effectively our use of those natural resources.

For example, one of the foremost issues for the coming decades is an expected change in sea level. Resource managers must anticipate and plan for sediment and erosion problems accompanying any predicted rise in sea level. The information to do this does not now exist.

4. A variety of programs and institutions conduct marine research within the state funded primarily by the federal government. However, there are limited means to support coordinated research addressing problems of importance specifically to Maine. In addition, recent trends have shown a decline in marine research funding from federal sources.

Sea Grant, the University of Maine System, DMR and several other institutions are working to address concerns in the marine environment. ARGO Maine, a consortium of research organizations, has been working to coordinate research among its members. However, there are not adequate funds to develop the broad research programs the resources in the Gulf deserve or even the research programs Maine people need to protect their future.

Research monies available through the Sea Grant Program have decreased since 1980. Adjusted for inflation, funding has declined by almost 45%, from approximately $475,000 in 1980 to $275,000 in 1988 (1982 dollars).

DMR's federal funding through the Anadramous Fisheries Restoration Act has remained funded at about $50,000 per year through the 1980s, while their Interjurisdictional Fisheries Act monies have also decreased by over 25%, from $212,500 in 1980 to $169,268 in 1988. Adjustments for inflation would make this even more dramatic.

Federal funding for marine pollution monitoring nationwide has fallen from $147 million in 1982 to $1[illegible] million in 1988. These figures also are not adjusted [illegible] inflation.

The National Science Foundation's (NSF) Experimental Program to Strengthen Comprehensive Research (EPSCOR) had $3 million budgeted for marine research in Maine between 1980 and 1985. While the EPSCOR program is being revived in Maine through the Maine Science and Technology Commission and the University, its focus will be much broader and will target support systems for more general research within the state.

5. **Marine research institutions in the state have basic facility constraints that must be addressed to enable them to continue to carry out high caliber marine research in the Gulf of Maine.**

DMR and Bigelow Laboratory have major space constraints at their facilities on McKown Point. In addition, many of the offices and laboratories on the Point are out of compliance with OSHA standards. Other research institutions also have problems with their facilities.

There has not been an overall review of the range of marine research facilities and needs within the state to guide planning and funding decisions.

6. **The University of Maine System has a shockingly inadequate marine research program considering the importance of the coast and ocean to Maine. A special Task Force on Marine Activities within the University of Maine has urged the University to strengthen its activities and organization in the marine field. The changes and actions they suggest are much-needed to increase the effectiveness of the University in marine activities.**

The University does not have an oceanography department and many of the faculty within the Center for Marine Studies are shared with other departments. The University also does not offer any undergraduate degree programs in the marine field. The State university's commitment to Maine's marine resources is very low considering the importance of Maine's ocean and quality of life.

A special task force within the University of Maine has recommended increasing emphasis by the University on marine activities. The report of the task force, endorsed by President Dale Lick, contains 33 major recommendations to strengthen the marine studies organizational structure, strengthen the University's position as a partner in marine research activities, and continue the development of a broad-based academic program in marine studies. The strongest recommendations are for the University to establish a Department of Oceanography within the College of Sciences and to stress the importance of a state match for the Sea Grant College Program.

7. The Bureau of Marine Science within the Department of Marine Resources is partially supported by federal funds. Recent trends have shown a decline in federal funds: three federally funded positions were recently lost and 10 more positions within the Bureau remain vulnerable to further reductions in those funds. This dependence undermines the long-term consistency and stability needed for an effective research program.

Funding for DMR's total activities in FY1988 totalled $1.9 million of which 72% came form the general fund, 22% from federal sources and 6% from other sources. However, more than one-third of the scientific staff and two-thirds of the support staff in the Bureau are funded by the federal government. Last year, three scientific positions were cut from federal funds.

8. The Bigelow Laboratory of Ocean Sciences is the largest private marine research organization in Maine, providing unique research capabilities important to Maine and attracting significant out-of-state funds and world-wide prestige to Maine. Yet lack of funds for basic institutional support and its dependence on temporary grant funding jeopardizes the future of its contribution to solving Maine's marine resource problems.

Bigelow Laboratory is a private, non-profit organization that undertakes basic research in biological oceanography. Bigelow has unique capabilities in the state for culturing marine phytoplankton (important for quickly identifying algal blooms), remote sensing of the oceans and flow cytometry.

The Lab's main source of income is research grants from federal agencies. In 1974, that income was $200,000 whereas in 1987, the Lab received $2.2 million in research grants. Bigelow Labs receives an annual state appropriation of $100,000 per year, representing 4% of its operating budget. However, it is the only firm source of income to provide financial stability for the Lab. This overreliance on "soft money" has meant that, at times, professional researchers have foregone their salaries for lack of funds.

9. Basic and applied research are important to managing and understanding the dynamics of the Gulf of Maine, as well as managing the impacts of growth and pollution on the quality of Maine's marine environment. Mapping and monitoring programs undertaken by state agencies and private organizations provide vital information for these research efforts. Yet these programs are skimpy and poorly funded.

> The main emphasis of the Commission's work has been to try to develop a mechanism to identify and fund basic and applied marine research needs in the Gulf of Maine. Monitoring and mapping of the marine environment is essential to sound marine research and sometimes is research in itself. Present state efforts at mapping and monitoring the marine environment fall far short of the State's needs if we are to manage our resources well.

IV. RECOMMENDATIONS

In response to these findings, the Commission has proposed legislation for introduction into the one hundred and fourteenth Legislature that will:

1. **Create a Marine Research Board within the Maine Science and Technology Commission to identify and fund marine research needs within the Gulf of Maine.**

   As proposed the Board would (see Appendix A):

   - develop a research priorities statement with an action plan designed to guide the board in its funding decisions;
   - administer a grants program focused on basic and applied research in the marine environment;
   - have staff to implement and administer the program;
   - be composed of the major users of or contributors to the field of marine research; and
   - identify facility needs.

2. **Fund positions within DMR's Bureau of Marine Sciences that are currently federally funded from the General Fund. These positions include six scientists, a clerk typist, a word processing operator, a technician and a carpenter.**

   Funding these positions from the General Fund would:

   A. Stabilize these positions in a time of shrinking federal funds (3 positions were cut last year), and

   B. Allow DMR to use the freed federal funds for specific marine-related projects.

3. **Fully fund the librarian and assistant librarian positions at DMR's McKown Point library. Half of each position is now paid for by Bigelow Laboratories for the Ocean Sciences. Full state funding would allow Bigelow's portion of this funding to be put toward the Laboratory's other critical needs.**

   The costs of supporting the Library on McKown Point are increasing. This facility, shared with DMR, is open to the public. Bigelow's costs are now approximately $40,000 which supports personnel within the Library.

In addition, the Marine Research Commission recommends:

1. **The current appropriation to Bigelow Laboratory be continued or expanded. The Commission also supports consideration of appropriations to other private organizations, for example the Mount Desert Island Biological Laboratory whose marine research missions are of importance to the state.**

   Bigelow Lab currently receives an annual $100,000 appropriation from the State of Maine. While this is only 4% of their operating budget, it does provide a measure of financial stability in an era of shrinking federal funds. The lab uses the Gulf of Maine as their laboratory, contributes to research of importance to the state and possesses unique research capabilities such as remote sensing and algal culture. The scientists are a source of expertise in various aspects of marine science and are active in public education and information efforts. In addition, the existence of a strong private lab makes for a pluralistic marine research community in Maine.

2. **The University of Maine's Task Force on Marine Activities report to President Dale Lick should be implemented without delay. This report makes solid recommendations to upgrade the University's role and effectiveness in the field of marine research and that effort should be supported. Specifically, the Commission supports the recommendation stressing the importance of a state match for the Sea Grant College Program.**

   As mentioned in the findings section, this task force has recommended 33 much-needed changes to give the University a more effective marine program. These changes should be implemented as soon as possible.

3. **Marine mapping and monitoring programs undertaken by state and private organizations. While the bill proposed by the Commission is focused on basic and applied research, continued monitoring and mapping efforts within the Gulf are essential to understanding our marine environment and the Commission strongly recommends increasing state support for this activity.**

   The Commission recommends increased support for mapping and monitoring efforts to position Maine to deal with current and future problems.

6882

APPENDIX A
PROPOSED LEGISLATION

DRAFT

FIRST REGULAR SESSION

ONE HUNDRED AND FOURTEENTH LEGISLATURE

Legislative Document No.

STATE OF MAINE

IN THE YEAR OF OUR LORD
NINETEEN HUNDRED AND EIGHTY NINE

AN ACT to Promote Marine Research.

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 5 MRSA, § 12004, sub-§ 8, P 19-C is enacted to read:

(19-C) Marine Resources	Marine Research Board	Expenses only	12 MRSA § 6271

Sec. 2. 5 MRSA, sections 13127, 13128 and 13129 are enacted to read:

§13127. Marine Research Board.

The Marine Research Board, as established in chapter 379, hereafter referred to as the board, shall carry out the purposes of this chapter.

1. Purpose. The board shall identify basic and applied marine research needs within the Gulf of Maine of interest to the state and shall develop a competitive grants program to address those needs. The board also shall work to foster cooperation between marine research agencies and institutions to efficiently carry out marine research. The board's focus shall be on basic and applied scientific research rather than technological development or technology transfer. The board shall coordinate its activities with the commission.

2. Composition. The board shall be composed of 13 members. The membership shall include a representative of the University of Maine System, a representative of ARGO Maine, one member representing nonprofit environmental organizations, one member representing independent higher education institutions, two members representing the scientific community, and two members representing marine resource industries. The Commissioners of the departments of Environmental Protection, Conservation, and Marine Resources, the Director of the State Planning Office and the Director of the Sea Grant College Program shall serve as ex-officio members.

2. Appointment. The Governor shall appoint all members of the Board, subject to review by the joint standing committee of the Legislature with jurisdiction over marine resources and to confirmation by the Senate. The Governor shall appoint the chairperson annually.

3. Terms. Appointed board members shall serve for 3 year terms. Initial terms shall be 3 members for one year terms, 3 members for two year terms and 3 members for three year terms.

4. Compensation. Board members that are not representing state agencies shall be compensated for their expenses in accordance with chapter 379.

5. Number of terms. Board members may serve no more than two consecutive terms.

6. Quorum. A quorum shall consist of 7 members. A quorum shall be necessary for the board to conduct its business at any board meeting.

7. Rules for the board. The commission shall consult with the board in the establishment of any rules relating to the board and their activities.

8. Staff. With the advice of the board, the executive director of the commission shall employ professional staff to administer and implement the programs and policies of the Marine Research Board.

§13128. Powers and duties of the Marine Research Board.

1. Research Priorities Statement. The board shall develop a biennial priority statement and action plan of marine research needs in the state of Maine. The statement will be submitted to the Governor and the Legislature no later than January 1 of each even-numbered year, except that the first statement shall be prepared by July 1, 1990. This statement and plan shall guide funding decisions and activities of the board. The board shall hold public hearings to gain insight into marine research needs for the state.

2. Data base. The board shall develop, maintain and periodically publish a bibliography of relevant research within the Gulf of Maine. The board also shall encourage integrated data management for data relating to Maine waters and the Gulf of Maine.

3. Facility needs. The board shall develop a facility needs plan for the support of marine research within the State of Maine that shall identify and focus attention on specific facility needs with the objective of fostering cooperation within the marine research community. The plan shall be finished by October 1, 1990 and may be developed with the help of contractual services. This plan shall not prohibit agencies from addressing specific safety problems within their facilities.

4. Other activities. The board also may sponsor and conduct conferences or publish periodic reports relating to marine research.

5. Cooperation. The board shall strive to coordinate its programs with existing policies and programs within the field of marine research..

§ 13129. Marine Research Grants Program.

The board shall develop and administer a competitive, merit-based grant program to address marine research needs for the state of Maine as set forth in section 13128, subsection 1.

1. Granting criteria. The board shall develop, and the commission shall approve, criteria for awarding grants under this program. Criteria shall include but not be limited to the quality of the research proposal and the ability of the organization to carry out the proposed research.

2. Peer Review. All proposals for funding shall be subject to peer-reveiw by a panel of experts in the field of

marine research that are not employed by or affiliated with marine research institutions within Maine. The commission, upon recommendation from the board, may contract with another entity to coordinate the peer-review process.

3. Granting decisions. The board shall make the final decision for awarding grants under this program. The board shall competitively evaluate and may award grants that conform to the granting criteria and are consistent with the research priorities statement and action plan developed under section 13128.

Sec. 3. Appropriation. The following funds are appropriated from the General Fund to carry out the purposes of this Act:

	1989-90	1990-91
MARINE RESOURCES, DEPARTMENT OF		
Marine Sciences, Bureau of		
Positions	(5)	(10)
Personal Services	$ 178,555	$ 323,066
Provides funds to allow for the transfer of positions from federal funds to the General Fund.		
Marine Sciences, Bureau of		
Positions	(2)	(2)
Personal Services	43,915	58,550
All Other	(14,672)	(19,562)
Provides funds for a Librarian III and a Library Assistant. The funding for these two positions is currently shared between the Department and Bigelow Laboratory. This results in a $29,243 increase in FY1989 and a $38,988 increase in FY1990.		

Sec. 4 Allocation. The following funds are allocated from the Federal Expenditures Fund to carry out the purposes of this Act.

	1989-90	1990-91
MARINE RESOURCES, DEPARTMENT OF		
Marine Resources Sciences		
Positions	(-5)	(-10)
Personal Services	$(178,555)	$(323,066)
All Other	178,555	323,066

Reallocates federal funds currently used to support 5 positions in Fiscal Year 1990 and 10 positions in Fiscal Year 1991 to provide additional funds for anticipated marine research activities within the Department.

Sec.5 Appropriation. The following funds are appropriated from the General Fund to carry out the purposes of this Act.

	1989-90	1990-91
EXECUTIVE DEPARTMENT		
Maine Science and Technology Commission		
Positions	(2)	(2)
Personal Services	$ 48,524	$ 64,699
All Other	52,500	1,559,250
Capital Expenditures	1,500	
	$102,524	$1,623,949

Provides funds to establish a Marine Research Board within the Maine Science and Technology Commission. These funds shall be used for professional staff, a Clerk Typist II and general operating expenses to administer the Board. In addition, this appropriation provides $40,000 in Fiscal Year 1990 for contractual services to develop a facility needs plan, $50,000 for Fiscal Year 1991 for contractual services for peer review of research proposals, and $1.5 million in Fiscal Year 1991 for the proposed marine research grants program.

APPENDIX B

MAINE'S MARINE RESEARCH NEEDS

REPORT TO
THE COLES LEGISLATIVE COMMISSION ON MARINE RESEARCH
ON
MAINE'S MARINE RESEARCH NEEDS[1]

SUMMARY

The wisdom with which Maine makes future policy decisions on important marine issues will increasingly depend on the degree to which it reaches a proper scientific understanding of the workings of the Gulf of Maine and its coastal waters. The promises -- and threats -- that the future holds for Maine's marine resources rest on the very premise that our decisions will be explicit rather than judgmental, and will thus depend upon the quality of information in hand. The need for the best scientific information obtainable has never been more urgent as underscored by recent events, including:

- Declining fish landings;
- Closures of shellfish harvesting areas;
- Reports of toxic substances in bottom sediments;
- Unexplained plankton blooms;
- Rising sea level and shoreline erosion.

With the coast of Maine facing inevitable pressures of continuing development it becomes all the more important that we:

- provide much-needed infrastructural support for our marine research institutions, and;

- develop and maintain a coordinated, comprehensive and sustained program of state-sponsored marine research in the interests of Maine.

The goal of a research program should be to provide the best scientific information possible with respect to:

(1) changes in water quality and biological resources of the marine environment that result from human activities and natural causes such as climatic variation;

(2) potential threats to human health resulting from the accumulation of naturally occurring toxins and pollutants in seafood;

(3) proper management of natural resources, including improved predictive capabilities.

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[1] / This document is the result of discussions among: the Maine Department of Marine Resources, the Mount Desert Island Biological Laboratory, the University of Maine, Bigelow Laboratory for Ocean Sciences, Bowdoin College, the State Planning Office, the Department of Environmental Protection, the Maine Geological Survey, the Department of Inland Fisheries and Wildlife, the Maine Sardine Council, and Maine Maritime Academy.

State marine research funds will:

- allow priority research and monitoring to be conducted, and thus;
- enable Maine to make full use of its considerable scientific talent;
- provide match for federal funding not now coming to Maine;
- insure that Maine will be ready to meet unexpected environmental crises.

A council should be appointed which has a full-time executive director and staff person, and which includes representatives from ARGO-Maine, industry, state government, and the Maine Sea Grant College Program. The council should have the responsibility and authority to:

- set priorities and coordinate marine research activities ;

- award state-funded grants on a peer-reviewed, merit basis and in keeping with the state's goals;

- report results of the program to state and local officials and interested parties;

- the council should take advantage of and not duplicate the administrative structure and the education and support services of the Maine Sea Grant College Program.

Funding for the council, including the research grants and administrative costs, should be 1.5 million dollars annually.

I. Introduction

The Gulf of Maine and its waters along our immediate coast represent a natural resource of immeasurable value to the people of the State of Maine. No one would disagree that wise management and conservation measures are required if these waters are to retain their value when passed on to future generations. But the formulation of rational management policies can never be any better than the scientific information made available to the decision-makers, and it is unfortunate that in many instances the quality of that scientific information is inadequate to explain observed changes in the marine environment. Examples around the country of troubled, mismanaged waters are many, including such notorious examples as Chesapeake Bay, Long Island Sound and Boston Harbor, but the waters off our shores are not presently in such a sorry condition. In comparison, our marine environments are relatively healthy. But without responsible foresight, the quality of coastal waters can only deteriorate.

The tendency for most of us is to respond to crises and not to anticipate them. This attitude of complacency welcomes the unexpected -- and nearly always costly -- end products of such inattention; such an attitude continues unchecked even in the face of numerous early warning signs. Recent trends in the Gulf of Maine, such as declining fish landings, closures of shellfish harvesting areas, reports of toxic substances in bottom sediments, rising sea level and shoreline erosion, and unexplained plankton blooms, have served to heighten appreciation of our marine waters and to underscore the need to manage wisely our various marine resources. But the present store of scientific information on the Gulf of Maine and its coastal waters is, unfortunately, out of step with growing demands for explanations of how to interpret changes and threats to the marine environment. All this comes at a time when federal funds for coastal research are becoming increasingly difficult to obtain, and, ironically, when the field of marine science is at the same time benefiting from technological advances which can be used to address a wide range of environmental problems. Clearly, the time is at hand to scrutinize policies for scientific research on the Gulf's waters and their resources, and to develop a research strategy for the 1990's.

In this assessment report we recognize the tremendous breadth of the marine related research needs of importance to Maine. They range throughout and perhaps beyond the issue areas of "Fisheries Management and Development, Changes in the Coastal Environment, and Industry and Commercial Development" as described in the 1986 UNH/UM Sea Grant Long Range Plan. They require the application of diverse talents from many disciplines, including: economics, law, engineering, natural science, sociology, policy, etcetera. In this, however, it is important to recognize that all of these marine issues and related research needs are derived from a natural system: the Gulf of Maine. Thus, our understanding of how that system operates in its natural state -- and how it may be perturbed by us -- is of first-order significance and underlies all of these derivative needs.

Research for developing an understanding of the Gulf of Maine represents a continuing, long-term need for the State. Such research can be considered both basic and applied in that it will be driven by a mixture of intellectual curiosity and one or more of the numerous important practical issues confronting the State. These latter include marine pollution in all of its myriad aspects; fisheries management, both capture and culture; and many aspects of recreation, tourism and coastal development. The critical points to be recognized are that: (1) understanding how the Gulf of Maine works as an interactive physical, chemical and biological system is essential for effectively dealing with these practical issues over both the short and long haul, and (2) to develop this understanding requires field observational and experimental research on the Gulf of Maine. Such research is costly and to be most effective will require a long-term commitment of resources, close coordination in its planning and implementation, and continuing communication with those who need or can use the data, information and understanding as they are acquired.

The purpose of this report is to identify important areas where more research on the environment and living resources of the Gulf of Maine is needed, and to recommend actions for the State of Maine, namely: a) to strengthen the infrastructure of our research institutions in order to provide a sound footing for the highest quality research, and b) to create a source of new funding for Maine scientists to conduct relevant research in an efficiently coordinated and interrelated fashion in order to best meet the growing needs of all who deal with marine issues in our state. Toward that end we propose here a programmatic approach for Maine to deal with the much-needed marine scientific research in the coastal and offshore waters of the Gulf of Maine.

II. Gaps in our scientific understanding of the Gulf of Maine and its coastal waters, and a program for future research:

Despite the capability for quality marine research and monitoring by Maine marine scientists we are, in fact, only skimming the surface of the many new areas of research that continue to arise and it is clear that there are a number of research needs not now being met. Unfortunately, the majority of those areas for which research is most needed do not easily lend themselves to federal research grant applications, in that they suffer from being too regional in nature and do not reflect national priorities or global significance. If Maine is to arrive at its goal of a proper scientific understanding of the marine environment, the initiative to begin such studies must be taken by our own state government.

Maine's basic marine research need is twofold: there needs to be better infrastructural support for our various research facilities - government, academic and private - and there must be a new, reliable source of funds with which to conduct the actual research. The three sections below argue for a set of research priorities facing Maine from its nearshore waters to the open Gulf of Maine. Highest priority should be attached to those issues closest to our shores. Each issue raised, however, must be approached as part of an overall research program to provide answers to priority questions outstanding today, and to have the expertise ready to respond to future problems.

Maine's Estuaries and Nearshore Environment

Nowhere on the east coast of the U.S. is the land-sea interface as complex as it is here in Maine and it is along this long and winding shoreline that terrestrial influences are transmitted. The most obvious terrestrial influence on the marine environment is river runoff.

The importance of fresh water runoff into the Gulf of Maine via numerous estuaries has never been directly assessed by a well designed, interdisciplinary research effort. The early work of Henry Bigelow showed that the spring discharge of winter melt-waters is responsible for the intense westerly-flowing coastal current along the northern Gulf and, as he pointed out, the annual discharge from only four of these rivers (Penobscot, Kennebec, Androscoggin and Merrimack) amounts to enough fresh water to raise the level of the entire Gulf of Maine by 1.5 feet per year. This ignores the largest river emptying into the Gulf, the St. John, as well as all the other minor rivers and streams. The effects of freshwater additions on the physics, chemistry, biology and geology of the Gulf of Maine are poorly understood.

Responses in the marine environment to perturbations resulting from recent increases in population growth and economic development along our coasts will be felt first by, and communicated to, the coastal waters along the land-sea interface demarcated by Maine's countless estuaries, bays and inlets. It is via our rivers and streams that most pollutants enter coastal waters, yet we know very little about the process of physical mixing and dispersion or the chemical transformations of such substances in the dozens of estuaries in Maine.

In addition to being pollution pathways, estuaries are themselves extremely productive ecosystems. Examination of the Maine coast reveals the abundance and diversity of our estuarine systems, and serves to underscore their importance. Just how productive these estuaries are, and how they contribute to the total production of the Gulf of Maine remain unknown. Speculation on their role as nursery areas for larval fishes, for instance, can only be resolved through more detailed research efforts than have been reported to date.

Sets of priority questions are:

1. What is the relative importance of the nearshore environment in overall biological production, given the high coastline length to water volume ratio of these systems? What fraction of overall production is retained within the nearshore environment, as compared to that exported into the coastal zone?

2. To what extent do estuaries act as filters to substances entering from rivers and streams, such as pollutants and nutrients, and prevent their passage to the coastal zone? How vulnerable to

different pollutants are the various estuarine systems? Where are trapped pollutants likely to accumulate?

3. What are the mixing and flushing regimes of these estuaries? What is the capacity of these inshore areas to assimilate additional anthropogenic nutrient loads?

4. What effect would proposed hydroelectric dams have on the suspended sediments loads which now reach the coast? Would the delivery of dissolved nutrients (from the rivers or by compensatory upwelling of coastal waters) be affected? Would the spring plankton blooms in the coastal waters, which are so important to the benthos and meroplankton (and hence to our fisheries), be adversely affected as a result of damping the spring pulse in freshwater runoff? What would be the effect on coastal erosion?

5. How does the circulation in estuaries and nearshore waters affect sediments? What is the pattern of sediment movement, dispersal and burial in estuaries and nearshore waters? How much suspended load and bed load reach the coast via export from estuaries? How permanently are polluted sediments buried?

6. What processes control the accumulation of chemical pollutants in the sediments of our nearshore waters? Are these substances biologically available? What causes blooms of dinoflagellates, such as those responsible for the recent shellfish kill in central Maine? Does some form of pollution cause them? Are they more common than we realize? Just what are the ecological effects we can expect fop particular pollutants and combinations of pollutants? What species now occur in the Gulf; do we have a reliable inventory? What do we presently know about the health, reproductive biology and pathology of our marine organisms? How do physiological processes affect and modify the bio-accumulation and bio-transformation of pollutants?

7. How do storms affect the shoreline and nearshore environments? Are storms the major agents of coastal re adjustment to long-term changes? Are storms likely to disturb dredge spoil dump sites?

8. What effects do commercial harvests of nearshore shellfish species have on marine wildlife species which make extensive use of these areas? What presently typifies the nearshore environment as may be referred to in cases of suspected alterations?

This list of questions highlights some of the more obvious areas in need of further research. Until we understand those processes occurring in the estuaries and near-shore waters, we can hardly expect to appreciate fully their influence on our marine resources or the oceanography of our coastal shelf waters.

The Gulf of Maine Coastal Waters

Beyond the estuaries themselves, in the roughly 20 mile-wide band of coastal waters of the Gulf of Maine, the influences of freshwater additions continue to be felt but are only poorly understood. This zone contains a mixture of low salinity estuarine waters and higher salinity offshore waters; the resulting density gradients drive a highly variable coastal current along the northern Gulf and affect the Gulf-wide circulation pattern. Also, enhanced vertical stability and nutrients derived from a combination of river and offshore waters in the vicinity of estuarine and upwelling plumes can be expected to be sites of sustained phytoplankton bloom conditions. The benthic habitat in the coastal zone is heterogeneous, ranging from exposed and submerged rocks to featureless, soft, mud bottom. Considering the extensiveness of estuaries along the northern Gulf and their apparent influence in the biological productivity of nearshore and coastal waters, it is not surprising that much of the production of fishable biomass occurs within 20 miles of the coast and inside the 100 m isobath; the linkages between this coastal production and estuarine-nearshore processes represent areas in urgent need of further scientific study.

Sets of priority, unanswered questions include:

1. What is the rate of coastal erosion/retreat and how much of it is controlled by sea-level rise?

2. What is the composition of the sea floor and how does the spacial variability in substrate influence: a) biological habitat, b) the physical stability of the environment, c) the capacity of the environment to absorb/bury pollutants? Are there unique geologic environments that deserve protection from ocean dumping?

3. What are the effects of varying river discharge on the physics of this zone? To what degree does freshwater discharge influence the forcing of coastal currents and the delivery of dissolved and particulate matter to the coastal waters and beyond? How can controlled river discharge, such as might result from extensive damming of rivers, affect the manner in which freshwater influences the coastal density field, and hence vertical mixing and estuarine-like coastal circulation? How do upwelling and the formation of fronts respond to freshwater input? How do wind mixing events and tides affect the "spreading" of fresh waters along the coast and thus modify the density field?

4. Do these discharges result in enhanced nutrient delivery, local upwelling, increased vertical stability, and/or salinity fronts which augment biological production?

5. Does the resulting production get shunted more efficiently through the benthos and thus help to explain coastal Maine's productive ground fisheries for vertebrates and invertebrates?

6. What are the cues that induce movement of commercial species, and the processes which control the transport of living organisms between estuaries and the coastal zone? What are the effects of different sediment types and processes (e.g. dragging) on habitability for various species?

7. How does the recently described eastern Maine coastal current and plume of tidally-mixed and upwelled waters influence such things as: interannual variations in the Gulf of Maine nutrient budget? Eastern versus western Gulf patterns of production? Advection of fish larvae, particularly herring?

The processes occurring in nearshore and estuarine waters would seem to be closely coupled to the coastal waters and visa versa, but we can only speculate as to how one system might respond to natural and artificial perturbations in the other. Moreover, the gaps in our knowledge do not end here; the productive coastal waters are also closely linked to oceanic and offshore Gulf of Maine waters.

The Open Gulf of Maine

Beyond the 100 m isobath of the Gulf of Maine are the deep basins and offshore banks and ledges. Though generally not as productive as the coastal water (excepting the shoal areas) these waters are sites of important exchange processes and seasonally productive events.

Most of the exchanges of water into and out of the Gulf of Maine occur through the Northeast Channel, a deep water access just east of Georges Bank. Waters which enter the Gulf through this channel do so at depth and hence bring with them a rich supply of essential inorganic nutrients. As much as half of this nutrient load comes to the surface in a very small area in the Grand Manan area, forming the coastal current/plume discussed above. Many have speculated that the magnitude of this delivery of nutrients may in fact dictate the level of biological production in the entire Gulf. We still do not know, for instance, what the seasonal rates are of such influxes of oceanic waters, nor do we know to what extent these waters mix with surface waters in other parts of the Gulf and at various times of the year to become available for photosynthesis. We do know that the vertical mixing of Gulf of Maine waters is very significant during winter; thus some of these nutrients which enter the Gulf are present when the spring bloom develops. But what is the ultimate fate of this admittedly huge amount of nutrients and subsequently fixed organic carbon? Do we see this reflected in our coastal fisheries?

We very much need to carry on where Henry Bigelow left off, and to continue to investigate the oceanography of the offshore waters of the Gulf of Maine, to identify the important water motions which dictate nutrient delivery and transport materials, and to assign values to exchange processes which must regulate biological production.

Sets of priority questions which remain outstanding to this day are:

1. What are the pathways for deep ocean water, and hence nutrient delivery to surface waters of the Gulf where they drive photosynthesis? What is the important interplay between vertical mixing and the springtime increase in daylight that cues the onset of the spring bloom? What is the magnitude of the low level but extensive primary production that occurs throughout the Gulf?

2. To what extent might the coastal zone serve as a sink for the primary production of the open Gulf waters? Conversely, how important are the open Gulf waters and sediments as sinks for coastal production? Does the open Gulf act as a site of seasonal refuge for certain species, such as shrimp and juvenile herring?

3. How significant are Gulf-wide plankton blooms as compared to near-shore and coastal production? How much of the production in each of these areas is consumed in the water column? How does water column production fuel production in the benthos?

4. What are the processes which control recruitment of commercial species?

5. What is the role of Gulf-wide nepheloid layers in distributing associated nutrients and pollutants?

6. How do Gulf stream eddies, which occur outside the Gulf of Maine and effectively set up a pressure head, affect the influx of nutrient-rich and dense bottom water into the Gulf of Maine? Is this a seasonally or interannually variable phenomenon?

These questions are in no way complete; our understanding of the offshore Gulf of Maine waters is insufficient to warrant extending this list further. But additional questions, and we hope, meaningful answers will surely follow-answers which will provide the framework within which we can feel more comfortable in dealing with the environmental issues of our time.

III. Recommendations:

1. We recommend that attention be given to the needs for better infrastructural support at our marine research institutions, and that each institution prepare a detailed plan for improvement.

The combination of State, Academic and Independent marine research institutions in Maine represents a powerful combination of disciplines to tackle the many research issues facing the state. Each has its own sets of expertise and working together we can maximize limited resources. But for such cooperative research efforts to come about, and for Maine to meet the challenges facing our marine environments, we must allow our scientists to make full use of their talents in the pursuit of the above sets of questions.

This means that we must face the need for better equipped, better funded levels of basic support at our major institutions.

2. Given the diversity of expertise at our marine research institutions we should not compete with one another in budget battles for limited state resources, but rather we should agree to such a set of priorities as outlined here, to set up a mechanism, such as a marine research council, to make available and award state funded research grants to scientists at our own institutions.

To meet the need for additional research funding to address the priorities we have set forth here, we recommend that a marine research council be formed to re-grant State funds in a peer-reviewed, merit basis for those research proposals which are directed at the above priorities. We believe that it is the duty of Maine to shoulder the responsibility to meet the research needs facing the state for which federal funds are scarce. The council should have a full-time executive director and staff person, and include representatives from ARGO-Maine, industry, state government, and the Maine Sea Grant College Program. The council should have the responsibility and authority to:

- set priorities and coordinate marine research activities in Maine;
- award state-funded grants on a peer reviewed, merit basis in keeping with the state's goals;
- report results of the program to State and local officials and interested parties;
- the council should take advantage of and not duplicate the administrative structure and the education and support services of the Maine Sea Grant College Program.

Funding for the council, including the research grants and administrative costs, should be 1.5 million dollars annually.

STATE OF MAINE
Department of Environmental Protection
MAIN OFFICE: RAY BUILDING, HOSPITAL STREET AUGUSTA
MAIL ADDRESS: State House Station 17, Augusta, 04333
207-289-7688

JOHN R. McKERNAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

MEMORANDUM

DATE: November 18, 1988

TO: Commission on Marine Research

FROM: John Sowles, Biologist, Maine D.E.P.

SUBJ: Marine Research Priorities

*** *** *** *** *** *** *** *** *** ***

Perhaps the best way we can suggest marine research priorities for the Commission on Marine Research, is to outline what we, a public service agency in direct contact with the public, see as needed to properly fulfill our legislated responsibilities.

Established by the Legislature, The Maine Department of Environmental Protection ..."shall protect and improve the quality of our natural environment and the resources which constitute it and shall enhance the public's opportunity to enjoy the environment by directing growth and development which will preserve for all time an ecologically sound and aesthetically pleasing environment."

By statute, the D.E.P. is charged with protecting more of Maine's environment than simply those components with exploitational value or public health implications. The premise for this is sound, in that, if the environment is protected, commercial resources and public health will, with but few exceptions, be well served. Aesthetic and recreational opportunities are as much a part of Maine's quality of life as safe drinking water. Their protection is consistent with the intent of the Legislature and the federal Clean Water Act. If our initial focus is public health or a commercially valuable resource, then by the time effects are found serious ecological problems may already exist. Accordingly, we strongly disagree that marine research priorities should be limited to public health and commercial fishery issues, although these certainly are high priorities.

Among the many laws administered by the D.E.P., the Water Classification program is probably the hub around which most, if not all state water laws are formed and is at least part of the basis for many other state laws affecting landuse, development, waste disposal, habitat alteration, etc. The classification program is actually the State's management plan for all Maine's waters and the means by which we comply with the federal Clean Water Act. The goal of our program is to "restore and maintain the physical, chemical and biological integrity of the State's waters and preserve certain state waters in their natural condition."

REGIONAL OFFICES
• Portland • • Bangor • • Presque Isle •

The primary means by which the D.E.P. achieves its classification goals is through licensing and enforcement of performance standards as well as ambient monitoring of receiving waters. Proper management of licensed activities assumes an adequate understanding of the activities and their effect on the environment. Too often, however, actions must be taken before sufficient information is available resulting in the trading of one problem for another, ineffective or sometimes inappropriate regulation. To achieve our statewide water management goals, the State must invest in research to provide scientifically supportable policies regulations, and methods.

I have identified 9 high priority research topics which the D.E.P. has recognized as necessary to the long term attainment of its mission. These topics meet the goals established in the November 4th meeting and are compatible with the 13 points of Senator George Mitchell's Marine Research Bill (in parentheses at the end of each topic). They are also projects which are beyond the capabilities of the D.E.P. and therefore appropriate topics for consideration by the Commission ar priority research.

. Pollutant transfer and transport Abundance of a chemical in water or sediments does not necessarily indicate an environmental problem. The key question is whether or not these chemicals are entering the food chain, whether they are bio-concentrating in tissues or castings, and what the breakdown rates and products are. Criteria exist for freshwater yet none exist for sediments. The information is critical to safely licensing discharges as well as assessing the threat posed by unlicensed activities. (#6)

. Tissue chemistry - At the organism level, there exists very little information to indicate the effect of different chemicals in tissues on physiology. Reproduction, growth, and behavior effects are not well understood. Not only is this information directly useful to resource managers, it is useful to environmental regulators needing to determine impacts associated with activities producing those chemicals.(#3)

. Sub-lethal toxic effects - While much information exists on acute toxicity of various chemicals, little is known of their chronic and sublethal effects. Growth, reproduction, and behavior are but some of the physiological concerns. For example, some fishery biologists are suggesting an avoidance response by fish to the presence of chlorine at levels below analytical detection thus blocking passage of fish up tidal rivers. At what concentration does chlorine become a problem? What season? This is a perfect example of balancing public health with commercial resources, yet to do so requires research to determine the exact levels necessary to properly manage both.(#3)

. Eutrophication - As the population of coastal Maine grows, the volume of domestic waste discharged to our coastal waters increases. We acknowledge that the assimilative capacity of our coastal waters is finite before adverse changes occur yet we do not know the incipient loading levels, the changes to expect, or the contribution of the many environmental variables specific to each receiving water. Much need to be done to develop predictive models for development of waste load allocations.(#3,6)

. **Biological indicators** - The newly revised Water Classification Program emphasizes biological community standards. The D.E.P. has developed standards for freshwaters which can be used to assess classification attainment. A parallel system must be developed for the marine and estuarine environment. Biological systems are widely used as indicators of environmental quality. They are particularly useful in determining whether or not certain activities are causing an ecologically significant problem. Development of marine biological standards is a crucial component to monitoring the effectiveness of environmental protection.(#1,2,3,4,5,6,7,8,9)

. **Methods development** - Efficient tools, especially interpretive techniques, for environmental assessment are lacking. Present methods are time consuming often resulting in missed opportunities, poor management decisions, and the potential for serious environmental and/or economic consequences. Basic questions such as "where in the marine environment are specific pollutants most likely to be found? Fine sediments, tissues, water, sub-tidal, intertidal, what salinity?" "What organs are most likely to accumulate specific chemicals?" What experimental sampling designs are most efficient and under what circumstances?" What is the statistical reliability of their results?" Investigations such as these would add immeasurably to the value of monitoring data and are suited to division into small graduate level projects.(#9,13)

. **Habitat Valuation** - If the Department is to "direct growth and development to preserve for all time an ecologically sound and aesthetically pleasing environment", there needs to be an objective means determining direction. Knowing which salt marshes, tidal flats, estuaries etc. are more important that others and why is key to properly directing development.(#2,4,7)

. **Public Health** - Two areas of contamination stand out regarding public health, neither of which necessarily constitute and ecological problem. Exposure of people to pathogenic bacteria and viruses through water contact recreation or shellfish consumption is fairly well understood and managed and does not threaten environmental integrity. Exposure of people to toxic or carcinogenic chemicals in food items, however, is less understood and risk not well established. Recommended acceptable daily intake levels have been established for only a handful of chemicals. Human health risk management suffers as a consequence.(#10)

. **Hydrodynamic modelling** - Effects of fresh water, sediment, and pollutant inputs are strongly influenced by coastal currents, upwelling, tides and mixing. In order to accomplish many of the preceeding goals, a thorough understanding of coastal hydrodynamics is imperative.(2,8)

While the D.E.P. is capable of monitoring ambient conditions, it suffers from a lack of information enabling it to put monitoring information into an ecological and human health perspective. Research into any of the above areas will enable the Department to manage wastewater, dredge spoils, urban runoff, sanitary wastes, aquaculture, snow dumps, landfills, and the many other activities under its charge, in a responsible manner.

BOWDOIN COLLEGE

MARINE RESEARCH LABORATORY

BRUNSWICK, MAINE 04011

16 November 1988

Ms. Gro Flatebo
Office of Policy and Legal Analysis
State House Station 13
Augusta, Maine 04333

Dear Gro,

Thank you for your letter of 7 November. Because of a family commitment I will not be able to attend the meeting on 21 November. I am enclosing some comments on the 25 October draft report to the Coles Commission.

My colleagues and I at Bowdoin believe that there is a problem with the priorities set in the draft report. Of 19 priority items identified in the draft report, only 6 deal with estuaries and the nearshore environment. At the present time the estuaries and nearshore waters of the Gulf of Maine are under acute development pressure. State decision makers need information on the ability of these systems to withstand human induced impact.

We believe that there are three general areas of nearshore investigation that must be addressed as quickly as possible.

I. How can we define what is a 'normal' or 'expected' state of a natural environment, i.e. how can we best detect changes in environmental conditions that are outside those normally observed. Given that all natural environments are in a constant state of flux, this is a non-trivial problem. It is imperative to do this so that the state can determine what is an 'unreasonable' change as required by law. It is also imperative that we do this so that deleterious environmental changes can be identified early on and an appropriate response can occur.

II. In order to prevent dilution of effort in regulation and control it is necessary to develop methods to identify those human caused changes in the environment that are actually associated with observed ecological changes. What is required is a way to relate observed concentrations of pollutants to observed ecological effects. To be able to determine which of the several pollutants present in an environment are actually associated with deleterious ecological effects will provide valuable input to long-range planners. We believe that this is an attainable goal for many species living in the Gulf of Maine.

III. We must determine the degree to which non-point sources of pollution. particularly nitrogen and phosphorous. are causing adverse changes in the coastal environment. It is virtually certain that the shellfish kill in Maquoit Bay last September was a result of excessive nutrient loading.

My colleagues and I at Bowdoin are primarily interested in looking at responses of marine animals and plants to the consequences of human activity. We have been developing a suite of stress responses in marine animals and plants. We have been working in the estuaries and very near shore waters because we believe that it in these areas that pollution effects appear first. We also believe that the Gulf of Maine is an excellent natural laboratory in which to study pollutant effects because relatively clean reference areas are more numerous than polluted areas. Because the same types of pollutants cause problems elsewhere. lessons learned here can be transferred to other locations.

We have been particularly interested in responses of marine animals and plants in multiple pollutant situations in the field. We believe that this is a very cost effective approach to assessing the environmental health of an area. Our approach has been to measure a number of stress responses in animals and at the same time determine body burdens of a variety of potential stressors such as heavy metals. petroleum compounds and synthetic organic compounds such as tributlytin. We have been using multivariate statistical techniques to successfully associate physiological responses with particular stressors. We believe that these techniques will allow those pollutants requiring immediate attention to be identified in field situations.

Goals I and II are currently being addressed at Bowdoin: we are beginning to address Goal III. Goals I and II speak to habitat assessment: Goal III speaks to resource management. I am enclosing a bibliography of 20 papers and 6 manuscript reports which represent work carried out by my colleagues and myself on Maine plants and animals.

My colleagues and I do not believe that inshore, applied marine research should be carried out in place of offshore, more basic, marine research. These types of research should be carried out in parallel. It is clear that research in both areas will yield valuable information that is not now being generated.

If you would like any further information, please do not hesitate to get in touch with me.

Best regards,

Edward Gilfilian
Director

APPENDIX C: CURRENT RESEARCH FOCUS BY INSTITUTIONS

This section outlines some of the agencies and institutions in this state that conduct research in or about the Gulf of Maine. While the list is not complete, it does reflect the diversity of groups involved in research. This section is broken down by sector: state agencies, academic institutions and private research institutions. Much of the text is borrowed from a memo by Dr. David Townsend to the Coles Commission on Marine Research (11/2/88), individual submissions to the commission and from "Coastlinks" a publication of Maine's Coastal Program.

1. STATE AGENCIES

A. Maine Department of Marine Resources

The Department of Marine Resources (DMR) is "the primary state agency engaging in research for the conservation of marine resources". The Bureau of Maine Sciences within DMR has underway research and monitoring programs in five categories: pelagic fisheries, benthic and demersal fisheries, lobster fisheries, fisheries and health and research services. The primary thrust of their research activities are both to develop and conserve the marine resources of Maine, giving the Department an applied science approach to marine research.

Funding for DMR's activities in FY1988 totalled $1.9 million of which 72% came form the general fund, 22% from federal sources and 6% from other sources. More than one-third of the scientific staff and two-thirds of the support staff in the Bureau are funded by the federal government. Two maintenance position also are federally funded. Last year, three scientific positions were cut.

B. Maine Geological Survey

The Maine Geological Survey (MGS) is mandated to gather, analyze, interpret, publish, and disseminate information relating to geological features of the State. Marine-related activities of the MGS are focused on the geologic and human response to sea-level rise; sediment budgets and the pathways, rates and mechanisms of sediment transport in the inshore area including dredging and spoils disposal; sediment accumulation and erosion in salt marshes and tidal flats and the evaluation of the mineral potential of Maine's coastal zone.

Specific marine projects include mapping the sea floor and performing routine mineralogical studies, evaluating the role of eroding bluffs to the sediment budgets of several embayments, evaluating dredge spoils dumped in Saco Bay and mapping coastal hazards on sand beaches. Funding for marine related projects this past year was approximately $95,000 from federal sources and $25,000 from state sources as state match.

C. Maine Department of Environmental Protection

The Department of Environmental Protection (DEP) is just beginning a marine monitoring program in 1988 to assess pollution in Maine's nearshore waters. The program is presently limited in scope and is characterizing four coastal areas (Boothbay Harbor, Machias Bay, Casco Bay and the Piscataqua River estuary) for the occurrence of heavy metals, PCB's, PAH's and selected organic compounds in soft sediments and their availability through the water column to blue mussels and the associated benthic community structure. Funding in FY89 includes $33,500 from the State and $31,000 from the coastal program.

D. Maine State Planning Office

The Maine Coastal Program of the State Planning Office receives federal monies from the Office of Coastal Resource Management, in NOAA. These monies are used to support planning and enforcement in coastal areas in Maine. In addition, approximately $350,000 is available to address issues and concerns in the coastal area. In the past, these funds have addressed predominantly land-based concerns although approximately $30,000 has been available for marine research annually. This program also has funded mapping projects within the MGS.

Currently, the SPO has received a grant from OCRM for $80,000 to strengthen and facilitate the interstate management of the Gulf of Maine's coastal and marine resources. The project will outline a methodology for environmental monitoring of the Gulf and produce a report on the state of the Gulf. The project seeks to strengthen institutional relationships between the states and provinces bordering the Gulf in order to facilitate bilateral management efforts.

E. Maine Department of Inland Fisheries and Wildlife

The Department presently conducts studies to determine the life requisites and status of various forms of marine wildlife, the location of sensitive or otherwise significant wildlife habitats, and habitat protection standards. The most recent work has been funded with Coastal Zone Management monies.

2. Academic Institutions

A. University of Maine

The University of Maine engages in a wide range of marine research, both basic and applied, reflecting the interests and expertise of faculty in various departments such as botany and plant pathology, microbiology, zoology, geology, civil engineering, physics, economics, and animal and veterinary sciences. The University's marine faculty and programs are coordinated under an umbrella organization known as the Center for Marine Studies.

Much of the marine research conducted at the University is funded by the federal government through the University of Maine/University of New Hampshire Sea Grant College Program. Sea Grant-funded research is directed at promoting the wise use, conservation, and management of the nation's marine and Great Lakes resources. Two major areas of Sea Grant research at the University include fisheries management and development and changes in the coastal environment. Sea Grant has approximately $400,000 available for grants annually.

Research at the University is also conducted and funded under the Maine Agricultural Experiment Station's Fisheries and Agriculture Group, as well as through the Maine Lobster Institute and the Ira C. Darling Center, which are part of the Center for Marine Studies. Funding for marine research at the University included $1,260,000 in direct costs in FY87, and $2,030,000 in indirect costs which includes basic infrastructural support, salaries for faculty, staff and administrative support.

B. Bowdoin College

The Marine Research Laboratory and Hydrocarbon Research Center at Bowdoin College conducts research on responses of marine animals and plants to human activity, in particular, the physiological responses of marine organisms to multiple pollutant situations. Funding at present comes primarily from the Mobil Foundation and college funds; this year's funding level is approximately $30,000.

C. Shoals Marine Laboratory- Cornell University

The Shoals Marine Laboratory, supported by Cornell University, is geared to educating undergraduates in marine sciences. Ongoing research activities include projects on cormorant colony dynamics and sea urchin/codium interactions.

D. The Marine Law Institute

The Marine Law Institute at the University of Southern Maine, conducts research and educational projects on legal and public policy issues concerning the marine environment. The Institute publishes a quarterly report entitled Territorial Sea as well as books and reports on specific topics. The efforts of MLI have focused on 1) management of the Gulf of Maine in light of the recent international maritime boundary dispute with Canada, 2) legal principles affecting the coordination of state and federal fisheries laws and policies, and 3) the use of science in marine resource regulation.

E. Maine Maritime Academy

Maine Maritime Academy offers a variety of marine oriented undergraduate and masters degree programs and is presently planning to offer a 4 year undergraduate program in marine science. While the Academy has not engaged in marine research itself, it does provide support by making its expertise and facilities available to the marine research community. The latest effort on behalf of the Academy is acting as the ship operator for the R/V Argo.

Undergraduate students in the new Ocean Studies program at the Academy will be required to participate in cooperative research experience aboard the R/V Argo and in shore based research labs. A viable Gulf of Maine research program will benefit the academic program at the Academy and the student participation will provide valuable assistance in conducting research on the Gulf of Maine.

3. Private Research Institutions

A. Bigelow Laboratory for Ocean Sciences

Marine research at the Bigelow Laboratory for Ocean Sciences is funded by grants and contracts which totalled $2,200,000 in FY87. The State of Maine provided $100,000 in direct infrastructural support; private funding at the Lab is approximately $40,000 per year. The remainder of the Laboratory's budget is met by individual research grants and contracts from federal agencies such as NSF, NASA, NOAA, and ONR.

Approximately one third to one half of the Laboratory's research concerns the Gulf of Maine; these are primarily "basic" research programs funded by grants awarded directly to the Principal Investigators. The research areas include studies of larval herring, benthic invertebrate populations, mid-water particle maximum layers, sediment geochemistry, phytoplankton and zooplankton dynamics, nutrient dynamics and physical oceanographic studies.

B. Mount Desert Island Biological Laboratory

Marine research activities at the MDIBL center about the comparative physiology of marine organisms from Frenchman Bay and the Gulf of Maine. Research is generally focused on organ actions, epithelia-cell membrane transport, and developmental biology. Approximately 50 scientists engage in research at the Laboratory at some time during the year, though as many as 150 may be present during the summer peak. The Laboratory's total budget for FY88 is approximately $675,000, coming almost entirely from federal sources, with the exception of $50,000, which comes from a private trust.

C. West Quoddy Biological Research Station

The goals of the West Quoddy Biological Research Station are to promote resesarch, education and wildlife rehabilitation of the West Quoddy/ Bay of Fundy region. Current programs include studies on indigenous and migratory species with emphasis on marine mammals and rescue and rehabilitation of injured or orphaned marine wildlife.

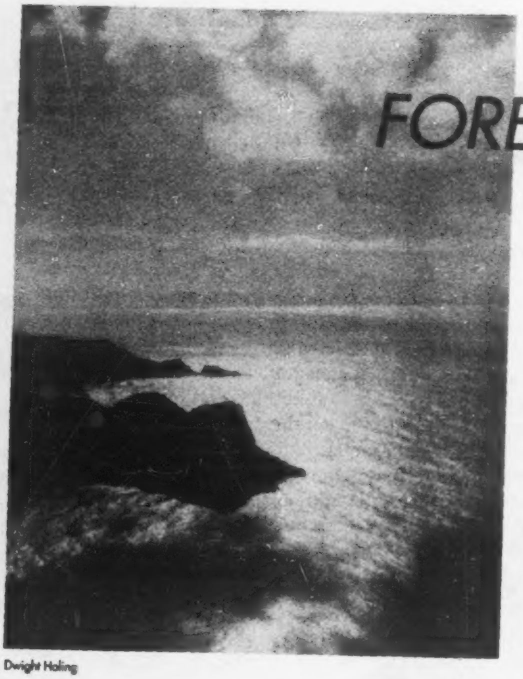
D. Association for Research in the Gulf of Maine (ARGO - Maine)

ARGO Maine is a consortium of academic, private and governmental organizations dedicated to promoting and coordinating marine research on the Gulf of Maine. The impetus behind the development of ARGO Maine was to stimulate a fisheries oceanography program focusing on basic oceanography. The group has evolved to include a perspective of coastal impacts on the marine ecosystem. ARGO Maine is comprised of the Bigelow Laboratory for Ocean Sciences, the Department of Marine Resources, the Maine Geologic Survey, the Maine Maritime Academy and the University of Maine. ARGO Maine supports an 80-foot research vessel and holds periodic conferences.

EBB TIDE FOR POLLUTION: Actions for cleaning up coastal waters

For all at last returns to the sea– the beginning and the end.
--Rachel Carson

FOREWORD



Dwight Holing

For me, and for most of us, no place on Earth holds more fascination than where land meets sea. Coast, beach, shore, and tidepool — no matter what we call it, our coastline is a source of beauty and wonder: palmettos rustling along the South Carolina shore, whooping cranes basking in the warmth of Gulf Stream waters, surf splashing on the beach at Malibu, and the lights of Manhattan reflected in a river bound for the sea. No wonder most of us strive to live close to these waters. They sustain us, spiritually as well as physically. The sea is life's genesis, and in some deeply instinctive way we flock to our primordial birthplace.

Ironically, our dependence on the coast is killing it. From Alaska's once unblemished Prince William Sound to Santa Monica Bay, from the retreating wetlands of Louisiana to sewage-choked Boston Harbor, the coast is floundering in an abused sea. Oil has invaded the home of sea mammals and sea birds. Medical wastes litter our beaches. Raw sewage swirls over oyster beds and through waters once teeming with fish. Industrial poisons pour into our coastal zones. And in many areas, marshes are being destroyed through diking and draining to make way for buildings and roads.

Many coastal systems can barely function as a result. Filled wetlands no longer filter and clean runoff from the land, and are no longer the home to a variety of marine species; eroded shorelines cannot buffer the onslaught of storms. As pollution becomes chronic and degradation long-term, the coast loses its ability to protect and provide. Habitat is lost. Species vanish. The entire food chain is affected; humans are not exempt.

While the situation is dire, it is not hopeless. There are solutions, sensible strategies that will clean up pollution and reverse the decline of our coasts. The Natural Resources Defense Council has a solid record of research and advocacy on behalf of the environment, and has compiled and offered a range of solutions.

The recommendations here are important and practical. The plan is directed to each and everyone of us in steps that we all can take as individuals and as a society. These are as simple as washing with phosphate-free detergent at home, using less water, and supporting strong land use planning in your community. I urge you to become involved and to act.

We have inherited a magnificent coast, yet our ability to pass this heritage to future generations depends on our willingness to reform the practices of the past. We cannot repair the damage caused by pollution and unwise development overnight. But with persistence, we can return our coastal zones to their natural vitality and beauty. Together we can turn the tide.

—Jean-Michel Cousteau
The Cousteau Society

INTRODUCTION

Town of Ocean City, MD

Like most of the great civilizations throughout history, the United States owes much to its proximity to the sea. In the early days, coastal areas provided the settlers with an hospitable environment: bays and estuaries, which supplied us with a rich bounty of food, and natural harbors, which allowed American cities to become among the richest in the world. The coast continues to attract. Today, over half the population lives within 50 miles of coastal waters, including those of the Great Lakes.

By building our largest cities along our coasts and continuing to crowd into environmentally sensitive coastal areas, we have placed an immense burden on the very ecosystem on which we depend for so much. Each year our factories dump no less than five trillion gallons of wastewater into coastal waters. We flush another 2.3 trillion gallons of sewage into them as well. And every time it rains or snows, massive amounts of poisonous substances, including gasoline and pesticides, are carried into the sea as runoff from our city streets and farms.

When we dump our wastes into coastal waters we pose a serious threat to the environment, the food chain, and our own health. By eating contaminated shellfish, for instance, we run the risk of contracting a variety of diseases, including typhoid and viral gastroenteritis. Worse, many of the substances absorbed by shellfish can cause cancer, birth defects, or other illnesses. Swimming in coastal waters contaminated by sewage is also unhealthy. The infectious agents in sewage have been linked to such illnesses as hepatitis.

Few regions in the country have escaped the effects of coastal pollution. In 1985, nearly one-third of the productive shellfish areas in the U.S. were limited due to actual or potential contamination by sewage or other pollution. Three sites within Puget Sound in Washington have been declared Superfund sites due to the amount of heavy metals found in the sediment. New York has prohibited the commercial sale of striped bass caught in state waters after the level of PCBs contained in the fish surpassed FDA allowable limits. Beaches along the East Coast have been closed because of a tide of used syringes and other medical waste. And swimming in California's Santa Monica Bay has been declared unsafe because of exten-

sive and chronic untreated sewage dumping.

While there is little doubt that the problem of coastal pollution is systemic, there are a few bright spots on the horizon. By strictly controlling factory discharges into Naugatuck River, for example, Connecticut has been able to reduce the level of toxic pollutants to the point where trout are now being stocked in the river's upper reaches. In Arcata, California, an artificial wetland has been built on the site of an abandoned dump and is being used to treat sewage as an alternative to pumping it into a nearby bay. The facility not only provides additional natural filtration and cleansing, but doubles as a wildlife sanctuary.

As these examples show, the problem of coastal pollution can be solved. However, much remains to be done. The Natural Resources Defense Council (NRDC) is meeting the challenge head on. For over 15 years, NRDC has been a leader in the fight to protect our country's waters, natural resources, and public health and safety. NRDC efforts helped to strengthen federal environmental laws, such as the Clean Water Act, the Ocean Dumping Ban Act, and the Coastal Zone Management Act. NRDC lawsuits ensured that those laws were implemented and enforced aggressively. Additionally, NRDC scientists developed new approaches to control society's wastes and to protect America's coastlines.

NRDC realizes there is a need for a unified program to save America's coasts. Such a plan of action must identify the severity and extent of the problem, the sources of coastal pollution, solutions that have worked in the past, and new steps that must be taken to stop the decline of our coasts. This report presents NRDC's plan to reverse coastal pollution. The report discusses:

- The importance of coastal resources.
- Threats to our coastlines — causes, severity, and extent.
- Ways to stop coastal pollution — past successes and new solutions.
- A plan of action to save our coasts.

The health of our coastal waters is crucial to our quality of life. Summer would not be summer without days at the beach. The annual migration to sun, surf, and sand supports a multibillion dollar coastal tourism industry. Coastal waters also are the basis of a multibillion dollar commercial fishing industry. The total U.S. commercial fish and shellfish catch from all marine waters was $2.3 billion in 1985 at the dock; half of this catch came from within three miles of shore. This translates into a lot of seafood dinners.

Healthy coastal waters are important from an ecological standpoint as well. Coastal wetlands provide three important benefits. They act as sponges, soaking up floodwaters and keeping them from reaching higher ground. Wetlands also serve as the nation's kidneys, filtering some types of pollutants through the actions of bog plants, sediment, and microorganisms. In addition, they provide a nursery for fish and wildlife.

Beaches, coastal marshes, and estuaries are all part of our national heritage. Their value goes far beyond economics. The lobster buoys of Maine and the harbor boats of New Orleans are symbols of the diverse benefits that we derive from coastal waters. But we must maintain healthy coastal waters for more than just ourselves — we must ensure that future generations will be able to go beachcombing on Cape Hatteras or shrimp fishing off Louisiana. By implementing NRDC's program now, we can protect all these things we love about the coast. If we don't, we will lose them forever.

4a

Richard Newman

THE VICTIMS OF COASTAL POLLUTION

The outward symptoms of the flood of toxic pollution, poison runoff, and sewage contamination inundating our nation's coastal waters are polluted beaches, dying fish populations, and contaminated seafood. Few parts of the country have escaped the fallout. Marine life isn't the only victim of coastal pollution. We all are — as consumers, tourists, and workers.

Contaminated Seafood

Coastal areas are among our richest fishing grounds. More than 70 percent of commercially important species of fish and shellfish depend on coastal areas as habitats. Many of the toxic contaminants pouring into our waterways are coming back to our dinner tables in seafood. Many coastal and estuarine areas are so contaminated that fish and shellfish cannot be harvested there since consumption would pose a serious health risk. Even areas considered pristine are vulnerable. Sediments in Casco Bay, Maine, for instance, are contaminated with heavy metals, PCBs, polycyclic aromatic hydrocarbons (PAHs), and pesticides at levels as high as some of the heavily polluted New England harbors further south. These pollutants are absorbed by winter flounder and mussels there.

Chemicals and Heavy Metals. Toxic chemicals and heavy metals dumped into coastal waters contaminate marine sediments and also concentrate in fish and shellfish.

Shellfish, including oysters, mussels, and clams, are especially vulnerable to contamination from toxic metals such as lead, mercury, cadmium, and chromium. These metals can cause a range of adverse health effects in humans, including kidney and central nervous system damage and birth defects in unborn fetuses.

Methyl mercury, a highly toxic form of mercury, has been found in large predatory fish such as swordfish and tuna. In March 1989, the Florida Department of Health advised consumers to avoid largemouth bass and warmouth fish from the Everglades after these gamefish were found to have the highest levels of methyl mercury ever recorded in the U.S.

***Coastal Waters** — All waters at or near the coasts, including bays, estuaries, the Great Lakes, and sounds.*

***Superfund** — A law passed by the U.S. Congress to respond to uncontrolled releases of hazardous waste at abandoned dumpsites and other facilities.*

Many cancer-causing industrial chemicals such as PAHs, petroleum hydrocarbons, dioxins, and PCBs have also been found in seafood. PCBs, which accumulate and concentrate to high levels in fatty tissues of fish, have frequently been found in older and larger predatory species such as bluefish, striped bass, coho salmon, and lake trout. Since the early 1970s, residents of the Great Lakes region have been cautioned to restrict their consumption of locally-caught lake trout, salmon, and other fish because of high levels of PCBs. Nursing mothers, pregnant women, women who expect to bear children, and children below the age of 15 are advised to completely avoid a wide range of fish caught in the Great Lakes because of the detrimental effects of PCBs and other chemical contaminants. Commercial sale of striped bass caught in all New York waters has been banned because of high levels of PCBs, as well. Consumers have also been advised on occasion to avoid eating bluefish caught along the East Coast because of PCBs.

Dioxins, one of the most toxic classes of substances known, have also been found in fish in a number of coastal areas. Dioxins can cause cancer and birth defects in humans. In late 1988, high levels of dioxins were found in carp, perch, and rainbow trout caught in some areas of the San Joaquin and Sacramento rivers in California. The dioxins were traced to industrial discharges from upstream paper mills. A more recent comprehensive EPA survey found dioxin-contaminated fish downstream of paper-mills all over the country, including many areas of important coastal fisheries. The highest levels were found in the Sampit River estuary in South Carolina.

Entire fishing areas have been contaminated. In 1988, EPA released a major study of Quincy Bay, a major commercial and recreational fishing ground in Massachusetts. As a result of chronic dumping of toxic substances from sewage treatment plant outfalls and industrial discharges, lobsters, flounder, and clams in the Bay are contaminated with PAHs, PCBs, and toxic metals. The most serious contamination found was the high levels of PAHs in lobsters. EPA determined that at the levels detected, these contaminants pose a significant risk of cancer and other health effects for people who frequently eat fish and shellfish from the Bay. Seafood lovers there have been advised to reduce their consumption of locally-caught seafood, and pregnant women to avoid it completely. This health advisory is still in effect today.

Agricultural pesticides such as DDT, dieldrin, and chlordane that have leached from or run off the land also contaminate fish. In 1987, FDA found some pesticide residues in 73 percent of the seafood samples tested from U.S. fishing waters. In fact, between 1979 and 1986, 5.2 percent of the seafood samples tested by the FDA had high levels of pesticide residues above the legal limits. This violation rate for pesticides in seafood is higher than for any other food group, including fruits, vegetables, and dairy products. These pesticide residues pose serious long-term health risks for consumers. For example, the levels of DDT and dieldrin residues found in fish from the Great Lakes are very high and pose a significant cancer risk for people who regularly consume locally-caught fish.

DDT contamination of sediments and fish in Santa Monica Bay and off the coast of Southern California is a good example of how persistent chemical contamination can be in coastal waters. Industrial discharges of DDT, a highly toxic pesticide, were dumped into Santa Monica Bay by a chemical company for more than 20 years. Although production of DDT was banned in 1972, the sediments in Santa Monica Bay are still contaminated with this pesticide and contain hotspots with the highest levels of DDT reported for any marine envi-

FDA advises against eating seafood when chemical contamination surpasses these action levels. However, with the exception of PCBs, these levels are only informal; they are not enforceable limits.

Source: FDA Action Levels for Poisonous or Deleterious Substances in Human Food and Animal Food. Government Accounting Office "Seafood Safety"

Chemical Substance[a]	**Seafood Group**	**Action level (parts per million)**
Aldrin and dieldrin	Fish	.3
Benzine hexachloride	Frogs legs	.3
Chlordane	Fish	.3
DDT, DDE, and TDE[b]	Fish	5.0
Endrin	Fish and shellfish	.3
Heptachlor and heptachlor epoxide	Fish and shellfish	.3
Kepone (chlordecone)	Crabmeat	.4
	Fish and shellfish	.3
Mercury (methyl mercury)	Fish, shellfish, and crustaceans and other aquatic animals	1.0
Mirex	Fish and shellfish	.1
PCBs[c]	Fish	2.0
Toxaphene	Fish	5.0

[a] Paralytic shellfish toxin was intentionally excluded from this appendix because it is a biologically produced chemical toxin.

[b] When amounts of DDT, DDE, and TDE are added, any of the three found below .2 parts per million for fish is not counted for compliance purposes.

[c] PCBs found at 2 parts per million in fish are the only poisonous or deleterious substances for which FDA has established a tolerance level that is promulgated through FDA's official rulemaking process.

Hepatitis *— Inflammation of the liver; can be caused by water-borne microorganisms.*

Gastroenteritis *— Inflammation of the stomach and intestines caused by water-borne microorganisms, causing nausea, vomiting, fever, and other symptoms.*

ronment in the U.S. Some fish in the area still have high levels of DDT today. For example, the average levels for Dover sole in 1986 was 6 ppm, although some levels ranged as high as 12 ppm. These levels are above FDA's 5 ppm action level.

The federal government does not have a comprehensive inspection program to protect consumers from chemical contaminants in seafood. FDA's only formal regulatory limit for chemicals in seafood is a limit of 2 ppm for PCBs. In addition, FDA has informal action levels in fish and shellfish for mercury, one of the toxic metals, and for 12 toxic pesticides, including aldrin, dieldrin, chlordane, DDT, endrin, heptachlor, kepone, mirex, and toxaphene. However, while FDA strongly recommends against sale and distribution of any fish with a higher level of contamination, these action levels are not enforceable limits.

Nor are there regulatory limits at all for other known toxic contaminants such as dioxins, PAHs, and toxic metals such as cadmium or lead. Less than one percent of the commercial fish supply is actually sampled by the FDA. What's more, the government does not inspect fish or shellfish caught by recreational fishermen despite serious chemical contamination of many recreational fishing areas.

Bacteria and Viruses. Fish and shellfish contaminated with bacteria or viruses are a major source of food poisoning. Seafood-borne infections can cause a variety of nasty symptoms, including nausea, cramps, diarrhea, fever, and vomiting. Some of these infections are a result of dumping inadequately treated sewage in coastal areas. Sewage often contains disease-causing microorganisms such as *Salmonella*, *Staphyloccus*, and *Vibrio* bacteria, and the virus that causes infectious hepatitis. When improperly treated sewage is discharged from treatment plants and livestock production facilities into coastal waters, these or-

Hypoxia — An oxygen deficiency in a waterbody.

ganisms can survive and contaminate shellfish. Pathogens in food are usually killed by heat during cooking, but eating raw or undercooked shellfish such as oysters or clams can cause serious bacterial and viral infections. New York reported 103 separate outbreaks of viral gastroenteritis involving over 1,000 people in 1982 alone. In rapidly developing areas such as the Gulf of Mexico and the South Atlantic states, bacterial contamination of shellfish harvesting areas is growing more severe.

The FDA, shellfish-producing states, and the shellfish industry cooperatively monitor harvesting areas for microbial contamination under the National Shellfish Sanitation Program, and close those areas with unacceptable levels of microbial contamination. Some of the most productive shellfish harvesting areas have been either closed permanently or are closed periodically after heavy rainfalls because of bacterial contamination. In recent years, 15 percent of tidal zones in Casco Bay, Maine have been closed to clam and mussel digging because of bacterial pollution from the dumping of inadequately treated sewage. In 1985, 57 percent of waters in the Gulf of Mexico were closed periodically or permanently.

Nationwide, waters approved for shellfish harvesting have increased in only seven of 22 coastal states and declined in 12 since 1966. In 1985, commercial shellfish harvests from approximately one-third of the productive shellfish areas in the U.S. were restricted due to actual or potential contamination. More than 80 percent of the 1985 harvest-limited shellfish areas were located along the southern Atlantic coast and in the Gulf of Mexico.

Biological Toxins. Coastal algal blooms such as "red tides" and "brown tides" caused in part by massive nutrient loading from sewage pollution and poison runoff create another kind of health risk for seafood consumers. Biological toxins such as ciguatoxin and paralytic shellfish toxins are produced by these algae. Fish and shellfish eat algae and accumulate these toxins, sometimes concentrating them to very high levels. These substances can cause severe food poisoning such as red tide paralytic shellfish poisoning in humans.

Diseased and Dying Marine Life

Chemical contamination of coastal waters hurts marine life. In heavily contaminated areas, fish and shellfish have developed physiological and genetic defects such as tumors in fish and chemical burns on lobster and crab shells. The most severe problems are found in non-migratory, bottom-feeding fish near toxic hotspots located around discharge points near urban and industrial areas. Bottom-dwelling fish caught in areas of heavily contaminated sediments exhibit a variety of abnormalities, including liver tumors, fin erosion, and cancerous lesions.

The stress on some of these fish and shellfish populations is substantial. The EPA, for instance, found that 83 percent of the native winter flounder population in Quincy Bay, Massachusetts had liver problems and 23 percent had tumors caused by exposure to toxic chemicals. At one time a rich clam harvesting area, most of the Bay is now closed to shellfishing, and the clam population, under severe stress, has been on the verge of collapse. In fact, EPA researchers had a hard time finding clams to sample.

Other fisheries also exhibiting high rates of tumors in fish populations include English sole in Puget Sound, winter flounder in Boston Harbor and Long Island Sound, starry flounder in San Francisco Bay, white croakers off the coast of Los Angeles, white perch in the Chesapeake Bay, and brown bullhead in Lake Erie and Delaware Bay.

Mass deaths of fish, known as fishkills, occur frequently along the Atlantic coast

Burn holes in lobster shells off the New Jersey coast are attributed to ocean pollution.

Jack Sprott, NYT Pictures

and in the Gulf of Mexico. A primary culprit is hypoxia, a condition of low oxygen levels in the water brought about by a number of factors, including the discharge of oxygen-demanding materials in raw sewage and poison runoff.

Huge areas can be affected by hypoxia. The New York Bight, Chesapeake Bay, and coastal Louisiana routinely suffer from hypoxic events resulting in fishkills.

Polluted Beaches

Recreational beaches are also victims of coastal pollution. High levels of bacteria in waters are responsible for many temporary or permanent beach closures, particularly along the North Atlantic coast. Between Memorial Day weekend and June 21, 1989, more than 40 beaches were closed in New York, New Jersey, and Connecticut because of sewage contamination. Bathing in sewage-contaminated waters can cause a variety of illnesses, and outbreaks of water-borne viral diseases such as hepatitis and viral gastroenteritis are on the rise. Skin ailments also result from contact with sewage-contaminated water. To protect public health, beaches are often closed when bacteria levels exceed levels considered safe for human exposure.

Worse still, even supposedly clean beaches are far from safe. In setting "safe" levels for bacteria in coastal waters, EPA assumes that 19 out of every 1,000 swimmers will become ill with gastroenteritis. Because of the high variability of bacteria content from day to day, your chances of getting ill increase as you spend more days in the water. While individual states are free to set stricter standards, many have simply adopted EPA's standard as their own.

Beaches have also been closed because of medical wastes. Used syringes, needles, bandages, colostomy bags, catheter and IV tubing, blood vials, and surgical gloves washing up on shore contribute to the destruction of the shores and pose a hazard to public health. Although there are presently no records of disease contraction from medical waste on the beaches, needles and other sharp objects pose a risk of puncture.

The full extent to which medical waste is improperly or carelessly controlled is unknown. NRDC's records show that medical waste has washed up on the shores of at least 17 states, including New York, New Jersey, Massachusetts, Maryland, Connecticut, Rhode Island, Florida, California, North Carolina, Ohio, and Texas. The U.S. Navy was responsible for certain dumping incidents in California, Florida, and North Carolina.

The lack of controls on the segregation, packaging, labeling, transportation, tracking, treatment, and disposal of medical waste has been exacerbated by the absence of a federal program that ensures minimum, uniform requirements. The need for such a federal program was never more evident than during the summer of 1988 when more than 100 miles of the East Coast were forced to close.

HOW WE POLLUTE OUR OCEANS

Atlantic City Press

Despite considerable progress in pollution control over the past two decades, factories still continue to release large amounts of dangerous pollutants into coastal waters. Each time we flush the toilet we send from two to ten gallons of our own pollution to our local public sewage treatment plants, which in turn discharge wastes into public waters. At least half of all water pollution comes from poison runoff from farms, residential lawns, city streets, and construction sites.

Pollution from Factories

Factories use tremendous amounts of water. It takes 27,000 to 32,000 gallons of water to produce a ton of paper, and 3,000 to 7,000 of these gallons are discharged as wastewater. All told, more than four out of every ten gallons of water used in the U.S. are for industrial purposes. The amount of water used by factories each decade would fill Lake Erie. Typically, one out of five gallons used actually becomes part of the products made. The rest is released back to coastal and inland waters.

Discharged industrial water is often not clean. It can be mixed with thousands of different chemicals. If released untreated, this toxic soup can kill marine life, contaminate food supplies, and endanger people who use waters for fishing, swimming, or drinking.

About 1,300 factories nationwide dump a total of about five trillion gallons a year directly into coastal waters. About half of these are along the East Coast, with the rest split nearly evenly between the Gulf and West coasts. Most of these discharges are to relatively shallow, sensitive waters close to shore. In addition to these direct coastal discharges, much of the industrial pollution released into inland rivers eventually reaches the ocean.

While strict new controls requiring major U.S. industries to reduce their discharges of toxic pollutants into coastal and inland waters by over 1,000 tons a day have been written into law thanks to pressure from NRDC and other environmental groups, shortcomings in the rules remain. Many factories and many pollutants are not covered. In fact, only about one-third of the nation's factories are covered by the regulations. Even where rules have been

TABLE 1

Factory wastes are the biggest sources of these coastal pollutants:

Toxic organic chemicals

Mercury

Arsenic

Other factory wastes include:

Biological wastes

Copper

Lead

Zinc

Oil

Chromium

Pretreatment *— A program required by the Clean Water Act where industries must treat toxic wastes before discharging them [illegible] public sewer systems.*

The schematic diagrams on the next several pages illustrate major sources of coastal pollution.

issued for a polluting industry, the regulations do not control the full range of dangerous pollutants. Because of these gaps, millions of pounds of uncontrolled toxic pollutants are released into U.S. coastal and inland waters each year. For example, organic solvents such as methyl ethyl ketone, acetone, and methanol are not regulated under EPA's program for limiting toxic discharges even though they are known to be toxic.

Until EPA closes all of the loopholes in its regulations controlling toxic industrial pollution and covers all factories and all toxic pollutants, our coastal waters will continue to deteriorate.

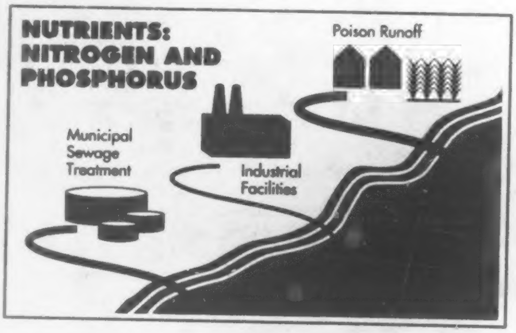
Sewage Pollution

What happens when we flush the toilet? In some cases, our sewage is treated by septic systems. Such systems can create serious environmental problems, generally by polluting groundwater. Polluted groundwater from large concentrations of septic systems can flow eventually into coastal waters.

Often our toilets are connected to a public sewer system, especially if we live in large cities or areas where soils are too rocky or too sandy to allow septic systems. This sewage is sent to a public treatment plant. Though the Clean Water Act calls for plants to treat wastewaters to a minimum level of secondary treatment, in which bacteria consume most of the organic content of wastes and disease-carrying organisms are destroyed, the treatment process is far from perfect.

Treatment leaves wastewater and sewage sludge as end-products. About one-fourth of sewage wastewater is dumped directly into coastal waters even though federal law encourages communities to reuse sewage wastewater for irrigation and similar uses. These discharges alone amount to about 2.3 trillion gallons of sewage waste each year. In addition, another 3.6 trillion gallons of sewage waste each year is released into coastal rivers that eventually reach the sea.

Even properly treated sewage wastewater contains considerable amounts of pollution, including bacteria, biological wastes, and nutrients such as nitrogen and phosphorus. These pollutants reduce oxygen levels in coastal waters and consequently suffocate life in productive waters. Many public sewage plants also accept wastes from factories. Over a trillion gallons per year of wastewater containing hazardous wastes are discharged into sewers by some 160,000 factories. Because public sewage treatment plants are primarily designed to treat household sewage, many toxic metals and organic chemicals from factory wastes go untreated. A 1986 EPA report estimated that without pretreatment, about 41,000 to 57,000 tons of toxic organic chemicals and about 68,000 tons of toxic metals are discharged from factories and other sources into public sewage treatment plants each year. These toxic contaminants end up in our water, in sewage


NUTRIENTS: NITROGEN AND PHOSPHORUS
Poison Runoff
Municipal Sewage Treatment
Industrial Facilities

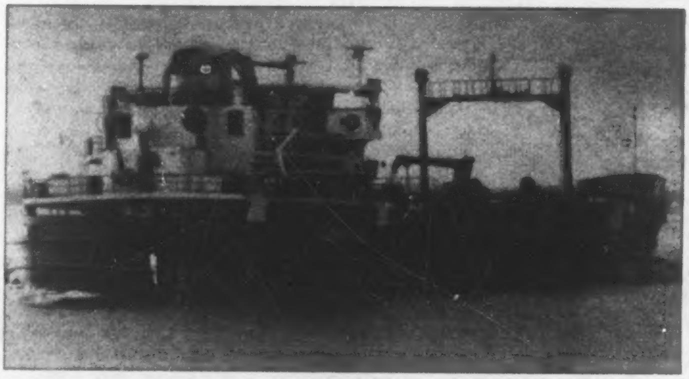
BOD *— Biological Oxygen Demand. The quantity of oxygen required by bacteria to break down organic matter in wastewater. Waste with high BOD lowers oxygen levels in water which harms fish and other aquatic life.*

Primary Treatment *— Mechanical filtration, screening, and settling methods for treating wastewater; typically removes 50 to 70 percent of suspended solids and 25 to 40 percent of BOD.*

Secondary Treatment *— Uses bacteria in an aerated tank to break down organic matter (BOD) contained in wastewater; typically removes 85 to 90 percent of the BOD contained in raw wastewater.*

Tertiary Treatment *— Advanced wastewater treatment methods employed in conjunction with secondary treatment such as addition of chemicals to remove phosphorus.*

Fecal coliform *— Normal, intestinal bacteria used as a proxy to estimate quantities of other, harmful bacteria and viruses.*



John Sotomayor, NYT Pictures

Nine New York and New Jersey municipal sewage treatment authorities use sludge barges to dump eight million wet tons of sewage a year directly into the Atlantic Ocean.

sludge that may be used for fertilizer or soil conditioner, and, in some cases, evaporate into the air we breathe.

Worse yet, some sewage wastewater dumped into coastal waters does not even receive full treatment. It only receives the initial stage of treatment, called primary treatment. This removes only the grossest contaminants via gravity settling or screening.

Even more disturbing, large amounts of sewage wastewater are dumped into coastal waters without receiving any treatment at all. This occurs when sewers designed to carry household and other sewage are combined with storm sewers. Although, generally, combined systems are no longer constructed, 1,100 to 1,200 remain in use across the country, particularly in older neighborhoods of urban areas. When it rains, these combined sewers overflow, bypassing treatment plants, carrying large amounts of raw sewage and other wastes directly into waters used for fishing and swimming. Combined sewer overflow is a threat to human health. It carries medical waste, bacteria, and viruses into coastal waters, contaminating beaches and seafood. Examples of cities with combined sewer overflow problems are Boston and New York.

Sewage sludge is the residue left after sewage treatment. Because sewage treatment plants are not equipped to deal with industrial toxics, the sludge produced is often contaminated with toxic metals such as cadmium, mercury, and lead; PCBs; carcinogenic petroleum compounds; and disease-producing microorganisms.

Some communities dump sludge into the ocean. Nine New York and New Jersey municipal sewage treatment authorities, including New York City, currently dump approximately eight million wet tons of sewage sludge directly into the Atlantic Ocean at a site 106 miles offshore. Until 1986, they used to dump their sludge 12 miles off the New Jersey shore. The site was closed after it virtually became a dead sea. Last summer there were reports of diseased shellfish and fish and reduced catches by fishermen in the waters above the Hudson Canyon, which is located near the new dump site.

TABLE 2
Poison runoff pollutants:

Biological wastes
Sediment
Nitrogen
Phosphorus
Chromium
Copper
Lead
Iron
Zinc
Oil
Bacteria

***Poison runoff** — Runoff from farming, development, and other land uses contaminated with harmful pollutants such as nutrients, bacteria, toxics, and sediments.*

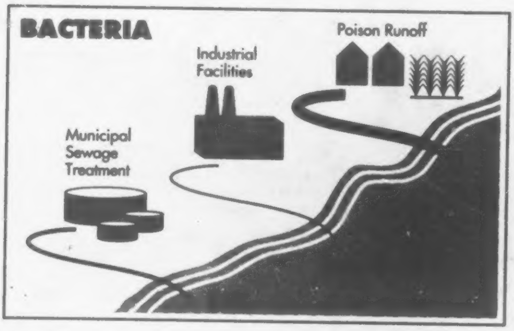
Poison Runoff

Coastal waters are also polluted by poison runoff from city streets, farms, building sites, parking lots, and other common uses of land. In fact, this type of pollution causes at least half of the nation's water pollution. According to figures released by EPA in 1989, of over 17,000 heavily polluted waters nationwide, less than 600 can be tied exclusively to point sources such as factories and sewage plants. The remaining waters are polluted, at least in part, by poison runoff. It is the leading source of many dangerous contaminants.

Poison runoff is increasing. We all contribute to the problem. The major culprit is growth and development. More people living near the coast means more runoff. Because trees, plants, and root systems act as giant sponges, land that is cleared and excavated for houses and condominiums has relatively high water runoff rates compared to undeveloped land.

While the amount of growth in coastal areas has much to do with the amount of poison runoff, the way in which we use land also contributes significantly. For example:

- We use more fertilizer and dangerous pesticides than needed to grow food and other crops. These chemicals run off farmlands and pollute our waters.
- Our homes, shopping centers, and other buildings are surrounded by acres of pavement. Rainwater that runs off these surfaces collects oil, chemicals, and toxic metals from cars and other sources, adding to the input of these pollutants to coastal waters.
- Tree cutting and construction of logging roads too close to waterways cause erosion that increases the sediment load of rivers.
- Even golf courses are a source of poison runoff. The average golf course uses 2-1/2 times as many chemicals per acre as farms just to maintain the quality of the playing surfaces.
- Overuse of fertilizer or lawn chemicals at home causes poison runoff.



The fact that poison runoff is made up largely of soil does not mean it is benign. Large amounts of soil particles in the water smother fish gills, cover critical bottom habitats where fish lay eggs, and choke out submerged grasses, which are a primary food source for waterfowl. The soil particles also contain contaminants. High levels of nutrients in polluted agricultural and urban runoff cause excess growth of tiny algae — a process known as eutrophication. These blooms lower levels of oxygen which may choke coastal waters and result in large fish kills.

EPA has also found at least 67 toxic pollutants in urban runoff. Dangerous in even small amounts, these pollutants threaten human health when they contaminate edible fish and shellfish. They can also be toxic to birds and other wildlife.

Far less progress has been made in cleaning up poison runoff than pollution from factories and sewage treatment plants because it is caused by a much larger number of sources. It is difficult to convince people that while each source contributes only a small amount of pollution, the cumulative effect is devastating.

Alabama Bureau of Tourism and Travel

Coastal Development

Over 50 percent of us live and work in coastal counties. The resulting development is a major contributor to coastal pollution. Typically, the more heavily developed an area of the coast, the more degraded the coastal water quality. It is no surprise that the coastal waters with the highest levels of chemical contamination are near large coastal cities. These include Boston, New York, San Francisco, and San Diego.

The threats to water quality associated with typical coastal development — large condominiums, single family homes and marinas — are primarily from harmful bacteria and nutrients such as phosphorus and nitrogen. The bacteria typically come from failed septic systems or discharges of improperly treated sewage from sewage systems. Excess quantities of bacteria, as well as phosphorus and nitrogen resulting from lawn and garden fertilizers, may reduce oxygen levels in coastal waters below those required by fish and shellfish to survive.

A residential development of 2,400 dwelling units on 400 acres of land could generate 277 lbs/yr of phosphorus and 2,130 lbs/yr of nitrogen. A major commercial retailing mall could generate 572 lbs/yr of nitrogen. Cumulatively, these types of development can have significant adverse impacts on coastal water quality.

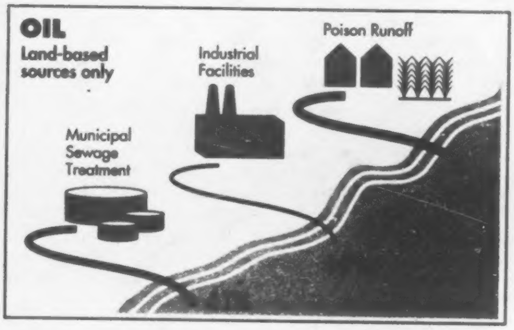
Another hidden source of pollution occurs at marina developments. Toxics from anti-fouling paints that have been applied at marinas to recreational and commercial vessels leach into the water and damage important marine organisms, including valuable shellfish. Also, careless boat owners often dump the contents of their onboard toilets directly into coastal waters, a particularly serious problem in and near crowded marinas.

Unless aggressive action is taken, coastal development will become an increasing contributor to coastal pollution. This is particularly true in such states as New Jersey, Maryland, and North Carolina where new development is increasingly located along bays and estuaries. In the Atlantic Ocean drainage basins of New Jersey coastal counties, an average of 16,000 new dwelling units per year were approved from 1985 - 1987. In North Carolina, the permits issued annually under the state's Coastal Area Management Act have more than doubled since 1979. In Florida's coastal counties, the permanent population has grown by 26 percent since 1980 and is projected to grow another 17 percent by 1995. NOAA's Office of Ocean and Marine Assessment estimates that approximately 20 million more people will be living in coastal counties in the year 2000 than in 1980, a 24 percent increase.

Ocean Dumping of Dredged Spoils

Each year, the Army Corps of Engineers dredges some 500 to 700 million cubic yards of material from harbors and channels. As much as 35 million cubic yards is highly contaminated with toxic materials, including pesticides, heavy metals, PCBs, and oil.

Much of this dredged material, or spoil, is dumped in the ocean. Even clean sediment that is dredged and dumped can have serious consequences for ocean life. For example, bottom areas rich in shellfish, crab, and flatfish can be smothered by dumped sediment. The problem may be persistent. Many bottom-dwelling fish such as sole and flounder are connoisseurs of mud. They require smooth, flat bottoms of certain consistencies. Spoil can disturb or degrade the contour and consistency of the bottom. Dumping in the presence of currents can carry silt and clay particles for miles. Marine plants such as kelp can suffer.



Where the dredged materials are toxic, there are special problems. Many studies have demonstrated the connection between contaminated sediments and contaminants in fish and shellfish. These species bioaccumulate toxics, and thereby make the poisons available to organisms higher in the food chain, including seals, otters, birds, and humans. Dredged materials suspended in the water expose marine mammals to contaminants.

The extent of sediment contamination around the country varies considerably. In some areas, such as portions of Puget Sound, sediment contamination is so severe that marine areas have been designated Superfund sites.

Oil Spills and Offshore Oil Discharges

Perhaps no type of coastal pollution is more dramatic than a catastrophic oil spill such as the one that recently occurred in Prince William Sound. The *Exxon Valdez* tanker spewed 11 million gallons of crude oil into the marine environment, oiling over 800 miles of pristine shoreline, killing at least 100,000 seabirds and 800 sea otters, closing the herring fishery for at least an entire season, and threatening the region's valuable salmon fishery. The bald eagle population in the area may be cut in half. It will take years before the full

Seabirds are especially vulnerable to coating from spilled oil. It causes them to lose their buoyancy and drown. When they preen their feathers, they ingest the toxic substance and are poisoned, usually fatally.

Alaska Department of Fish and Game

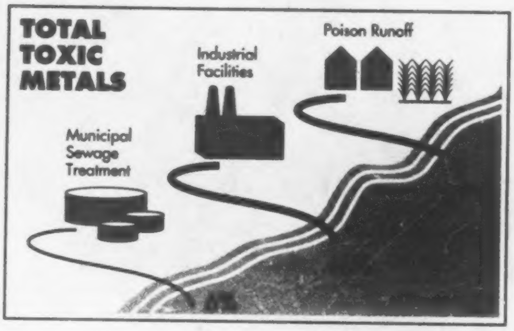
extent of the ecological damage is determined.

The disaster underscores the fact that oil spills of such magnitude do occur despite industry assurances to the contrary. When they occur, industry's ability to contain and clean up such spills is woefully inadequate. And smaller but still harmful spills this year in Delaware, Texas, and Rhode Island show that oil spills can occur with disturbing frequency. The fact is, oil spills are a major risk to the marine environment. Oil in marine and coastal environments can have devastating impacts. Petroleum hydrocarbons are extremely toxic to a wide variety of marine organisms at very low concentrations. In addition to direct lethal effects, petroleum hydrocarbons exert sublethal effects, including reduced growth, altered feeding behavior, and lower reproductive success. Oil spills have produced mortalities of birds, marine mammals, and fish and their eggs and larvae, as well as decreased fish growth rates, spawning inhibition, and declines in fish catches. Oil spilled in sheltered lagoons and wetlands may persist in sediments for decades where it can continue to affect bottom-dwelling organisms. Oil spilled in West Falmouth, Massachusetts, after the barge *Florida* ran aground in 1969, remained in the sediment for at least 13 years. Scientists say it suppressed crab populations for several years.

Offshore drilling operations, as well as tanker transportation, can cause coastal pollution. They also generate huge quantities of waste materials, most notably drilling muds, which lubricate the drill bit and maintain downhole pressure, and cuttings, pieces of rock ground by the bit that are coated with mud. Each time a well is drilled offshore, an average of 1,500 to 2,000 tons of drilling muds and cuttings are produced and must be disposed. This is usually accomplished by discharge into surrounding waters.

EPA estimates that the total annual BOD from these ocean-discharged muds and cuttings may be more than six times higher than the total BOD of all ocean-dumped municipal sewage sludge. Drilling muds also contain significant amounts of toxic pollutants, including cadmium, copper, antimony, arsenic, lead, and mercury.

In addition, produced water — water in the formation that is produced along with oil — is generated in tremendous quantities by offshore production operations. The oil industry has estimated that over 1.5 million barrels of produced water are discharged into the



Gulf of Mexico each day as a result of offshore oil and gas production operations. Produced water often contains large amounts of dissolved or emulsified oil and grease, as well as large quantities of toxic pollutants.

Plastics and Floatables

Marine life and beaches are affected by nonbiodegradable plastic and styrofoam objects, such as packing beads and pellets, fish nets, and beverage can yokes. Plastic is extremely persistent in the marine environment and reduces the aesthetic quality of our coasts. The principal harmful effect of plastic litter is felt by marine mammals, birds, and fish that ingest or become entangled in the debris. An estimated 100,000 marine mammals, such as seals and sea lions, and thousands of birds die annually from ingesting or becoming entangled in plastic. In a recent incident on Long Island, 11 of 15 beached leatherback turtles had plastic bags blocking their stomach openings. Turtles apparently mistake the bags for jellyfish, a favorite food.

Although the amount of nonbiodegradable litter disposed in the marine environment is unknown, its sources are well documented. Commercial fisheries lose large quantities of plastic nets, and recreational and commercial vessels often dispose of their wastes at sea. Land-based activities, such as poor solid-waste handling and antiquated sewer systems, are additional sources of plastics to the coastal ocean.

Even the most remote areas of our coastline are plagued by plastic litter. However, nearshore waters and coastlines near urban areas and major shipping lanes are the most affected. The western Gulf Coast beaches are the most littered in the nation. Over 65 percent of litter on Texas beaches is plastic and foam. Experts have called Padre Island National Seashore one of the dirtiest stretches of coastline in the country.

Improper disposal of plastics and litter not only detracts aesthetically, but poses a hazard to wildlife as well.

Atlantic City Press

3 ACTIONS FOR CLEANING UP COASTAL WATERS

Cleaning and protecting the nation's coastal resources will take a national effort. NRDC has identified the ways and means to help end coastal pollution and restore the health of our coastal waters. Controlling industrial discharges, sewage, poison runoff, coastal development, oil spills, and medical waste will help prevent beach closures, fish contamination, and risks to human health.

Control Factory Discharges

We need to eliminate the toxic water pollutants from both municipal treatment plants and industrial facilities. Certain steps can be taken right now; others will require that federal and state governments immediately begin to develop new, badly needed regulations.

We must enforce the current law. National standards exist today to control the discharge of toxic pollutants from factories — both plants that discharge directly into our coastal waters and those that send their wastes to municipal plants for further treatment before discharge. A recent government study showed that present-day enforcement of these rules is far from adequate: nearly half the programs to control industrial waste reaching municipal treatment plants were found to be in violation of minimum national standards, and at least four out of every ten discharges of toxic wastes into sewage plants violate their permits. Until a real commitment to enforcing current law and rules is made, we will not control this problem. Such enforcement can have dramatic results. For example, a 1989 study by the Chesapeake Bay Foundation reported a 50 percent drop in levels of chromium, copper, and nickel in the effluent of Baltimore's Back River sewage plant following enactment of an industrial pretreatment program.

We urgently need new rules for problem industries. A 1986 EPA study found that national rules setting minimum treatment standards for a number of industries that use very toxic chemicals were lacking.

EPA has developed regulations to cover only part of the total list of toxic chemicals discharged by many industries. For instance, organic chemical

TABLE 3
Examples of major industries that release more than a million pounds of toxic water pollutants per year:

Pharmaceuticals
Equipment Manufacturing
Textile Mills
Coal Mining
Iron and Steel
Leather Tanning
Metal Finishing
Ore Mining
Oil Refining
Pulp and Paper Mills
Chemical Producers

manufacturers discharge about 2.5 pounds of unregulated toxics for every pound of regulated toxics discharged. Clearly, current efforts to regulate discharge of industrial toxics to coastal waters need to be greatly augmented. We need a moratorium on new discharges that cause or contribute to violations of coastal water quality. One of the main problems in estuarine and coastal waters is the cumulative impact of many different sources of toxic contamination. Each new discharger may add only a relatively small amount of mercury, lead, or benzene to the water; but, taken together, these discharges add up to a major water quality problem.

The time has come to say nobody has a right to pollute. We also propose that no discharge permits should be issued to new factories seeking to discharge toxic wastes into coastal waters and no old permits should be renewed unless the discharger shows that it has made every conceivable effort to deal with its wastes in some other environmentally sound way such as waste reduction or recycling.

Control of factory pollution can be successful. An example can be found in Connecticut. The Naugatuck River, which also flows into the Housatonic River and Long Island Sound, was formerly one of the most polluted rivers in the country. Strict controls on metal finishing plant discharges resulted in much lower levels of toxic pollutants. Experimental trout stocking is now taking place in the upper reaches of the river.

Still another case of successful pollution controls involves the Delaware River Estuary. EPA conducted a study of the effect of industrial pollution controls on 64 factories and 10 toxic pollutants. It found sharp reductions in these pollutants throughout the estuary. In the zone where saltwater mixes with freshwater, levels of cadmium and mercury have decreased by 91 percent and 55 percent, respectively, over approximately the past 10 years.

Controlling industrial discharges is necessary if we are to clean coastal waters.

Improve Sewage Treatment

We need to build more and better sewage treatment plants. Where there are people, there is the problem of sewage treatment. And where there is inadequate sewage treatment, there is water pollution. Since current population density is greatest in coastal areas, and since more people are moving towards the coasts every day, it comes as no surprise that the need for new or upgraded treatment plant construction over the next two decades is expected to be concentrated in the coastal states. Coastal counties experienced a 69 percent population increase between 1950 and 1980; NOAA's Office of Oceanography and Marine Assessment predicts that between 1980 and 2000, there will be an additional 24 percent population increase. (This figure does not include the Great Lakes.)

Despite a national push to improve municipal sewage treatment facilities — from 1972 through 1986, the federal government awarded over $40 billion in grants to help cover the cost of building and upgrading municipal sewage plants while states and localities spent another $73 billion — more needs to be done.

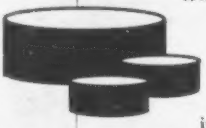
And what has been done already often isn't enough. For example, since the late 1960s and early 1970s, some Gulf Coast locations have significantly reduced the levels of nutrients and oxygen-demanding chemicals discharged from municipal and industrial sewage treatment plants. As a result, major fish kills caused by low oxygen levels have been reduced, and in some areas there has been a reduction in levels of disease-causing bacteria. But a rapid population rise, along with continued industrial development and dredged spoil disposal, is threatening to overwhelm this progress.

San Francisco Bay has also seen improvements that have not gone far enough. Wastewater treatment plants have contributed to some marked reductions in environmental impacts from industrial and municipal discharges since the early 1960s, but problems persist because major volumes of pollutants continue to be discharged — ranging from disease-bearing organisms to toxic heavy metals and PCBs.

There is no getting around the fact that we need to keep up with the need for construction of more and better sewage treatment plants. EPA found that 6,248 treatment facilities presently have documented water quality or public health problems. The agency's 1988 assessment of the cost for the facilities we will need by the year 2008 (not counting the costs of operating and maintaining them properly) was $83.5 billion. That's over $350 for every American. A combination of federal, state, and local efforts will be needed to prevent this backlog from growing worse.

We also need to take steps to cut back the need for new facilities. Several things can be done to try to reduce the volume of wastewater requiring treatment. First and foremost, water efficiency should become a way of life for all citizens. According to some estimates, more efficient home plumbing products like the 1.6-gallon flush toilet could save 40 percent of the water presently used in American houses. In addition to saving water, energy, and money at the water supply end, it also saves money and reduces pollution at the waste treatment end. Legislation mandating plumbing efficiency standards for all newly-constructed or renovated buildings is now pending in Congress, and similar laws have passed already in several states. We need these national plumbing efficiency standards as soon as possible.

We also need to close the loopholes and improve the level of treatment. As a general rule, the Clean Water Act establishes a bottom line for the amount of treatment that must be given to sewage effluent before it can be discharged into our waterways. But the law today also includes a loophole for coastal treatment plants. Under certain circumstances, coastal plants are allowed to discharge sewage into the ocean with less treatment than would be allowed for inland treatment plants. As of January 1987, EPA had approved 46 such exceptions, most of them on the West Coast.



Is this loophole appropriate? We don't think so. Coastal waters bear the brunt of pollution, both from pipes and from poison runoff. Our overstressed coastal waters should not be taxed still further by giving coastal treatment facilities this free break.

We need to reuse water, not throw it away. It is far better to look at creative and effective new means for treating municipal sewage and making use of the effluent resource than simply to dump wastewater in estuaries or the ocean. For example, Arcata, California has developed an alternative to pumping treated sewage into nearby Humboldt Bay. The town has constructed an artificial wetland to which sewage that has received initial treatment is directed for further natural filtration and cleansing. The facility doubles as the Arcata Marsh and Wildlife Sanctuary, attracting birds and wildlife as well as wildlife enthusiasts. Clean sewage effluent also can be used to irrigate crops, forests, or parklands; for industrial cooling or processed water; or to replenish groundwater supplies. Of course, for some of these uses the sewage effluent must be more thoroughly treated and free of industrial toxics.

We need to end overflows from combined sewer systems. It is time to address the water quality impacts from combined stormwater and sewage collection systems that overflow into marine waters. EPA estimates that these types of systems carry the wastes of 12 million people.

The best long-term solution to the problem of combined sewer overflows is to require adequate treatment. The wastewater leaving a combined sewer system should be treated just as it would be if it were to reach the sewage treatment plant. It should not be dumped untreated into our coastal waters. Shorter-term solutions include eliminating outfall points wherever possible, increasing the capacity of sewage plants, and building storage and treatment facilities for sewer overflows.

There are technological solutions to control combined sewer overflows, although they are not free. Devices can be constructed to hold stormwater flows until a storm event is over so that the water then can be sent to the treatment plant. Or the pipes in the sewage system itself can be used as a retention basin with flows released to the treatment plant over time as the storm abates.

Another way to curb overflows is through an increased focus on water use efficiency both in homes, and by industrial dischargers who nationally contribute about 12 percent of total wastewater flow to sewage treatment plants. EPA and the states have authority to impose water conservation and reuse requirements on industrial facilities that discharge wastewaters to coastal plants. They should exercise it more often.

Revise Pollutant Limits to Protect Water Quality

We need to revise the limits set on the amount of pollution a factory or sewage treatment plant is allowed to discharge. Contrary to popular belief, these limits are not always based on protecting the river, lake, or ocean water that the discharge enters. Instead, they are often based on so-called technology standards.

Routine water sampling can help make sure factories and sewage treatment plants are staying within pollutant limits.

Jessica Landman

Imagine a steel plant that discharges a million gallons of wastewater a day into Chesapeake Bay. Mixed in with the wastewater is 1,000 pounds of cyanide — the amount that would be discharged without any controls. In writing a permit for the factory, the regulatory agency examines the manufacturing process used and the kind of wastewater discharged. It then looks at the various treatment technologies available for removing pollutants from the discharge. The agency selects the best available technology (BAT) and requires the factory to install that equipment.

What result does this have for water quality? That depends on just how good the BAT is. In the case of the steel plant, if the BAT will remove only 80 percent of the cyanide, the plant will get a permit that lets it discharge 200 pounds of cyanide a day without regard to the effect the discharge will have on water quality.

A better, more environmentally conscious way to write permits is to base them on the stricter of the technology-based standards, or on the effect of the discharge on the receiving waters with a goal of maintaining the quality of pristine waters and improving the health of degraded waters. This requires studying the effects of pollutants on marine ecosystems and determining the amount of pollutants that can be present in the body of water without degrading it. The total load of cyanide that a stream may be capable of absorbing without degradation may, if it has a small volume, be zero. If that is the case, a permit based on water quality limits would not allow the discharge of any cyanide.

In fact, this type of water quality-based control is required by the federal Clean Water Act. Unfortunately, according to a 1989 Government Accounting Office report, few permits are actually written this way. Coastal waters will begin to be better protected if states write permits that reflect actual local water quality problems.

End Sewage Sludge Dumping

We need to phase-out and terminate ocean dumping of sewage sludge. This is an important step toward securing a clean and productive environment. Significant groundwork has already been laid in this respect. In 1988, Congress responded to enormous public pressure and enacted the Ocean Dumping Ban Act of 1988, which requires EPA to force a phase-out of dumping.

The new law sets a December 31, 1991 deadline for the end of ocean disposal of sludge. It also declares that any ocean dumping of sludge will be illegal after August 4, 1989, unless EPA has both issued to the municipality a permit to continue dumping and has entered into a satisfactory agreement with the municipality to stop ocean dumping as soon as it can.

Permitted municipalities that cannot meet the 1991 deadline will have to begin paying per-ton dumping fees into an escrow account beginning in August 1989, and will pay increasing penalties for every year dumping continues.

The Act opens the way for the complete and systematic end of ocean dumping. EPA has the power to preclude the risk of lingering dumpers and to lead the dumpers toward environmentally protective long-term solutions. Much is at stake in the discharge of EPA's obligations. Both the health of the ocean environment and the health of the land environment will be affected by decisions under this Act. The dual challenge to EPA officials is to get dumpers out of the ocean and to accomplish this in a way that does not spawn a generation of new problems on land or in the air.

There are alternatives to sludge dumping. Seattle, for instance, ships its sludge to forests where it is sprayed on saplings, substantially increasing their growth rates. Chicago and Portland and Salem, Oregon regularly use their sludge to fertilize local farms and plant nurseries. Milwaukee has been converting its sludge to a soil conditioner for the last 62 years.

Limit Poison Runoff

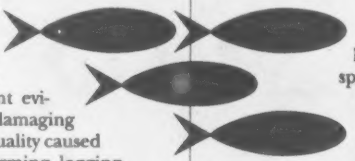
We need to control poison runoff if we are to restore and protect our coastal waters. A great deal still remains to be learned about the science of poison runoff. We don't know, for example, which agricultural chemicals cause the most harm to wildlife. Nevertheless, we already have plenty of information about what types of poison runoff controls work best.

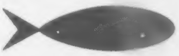
NRDC recently completed a major two-year study of the ways and means to control poison runoff, entitled *Poison Runoff: A Guide to State and Local Control of Nonpoint Source Water Pollution.* We concluded that the tools available to us today can do the job, but we need to make a major political and financial commitment if they are to work.

So far, many states have been slow to control poison runoff. A reluctance to act comes from several sources. First, there is a shortage of money from the federal government. Congress has not agreed to spend the $400 million in grant funds it authorized in 1987 to help states get their programs moving. Second, states are reluctant to shake up the status quo. For example, state officials do not like to regulate farmers. They prefer to rely on purely voluntary programs to control agricultural chemicals and soil erosion. Nor do they like to tell people what they can and cannot do on their land. Traditionally, this has been the job of local government.

This reluctance must be overcome. Some of the ways in which we do business will have to change. Many of the changes we need to make have already been implemented regionally. Several regions and states have already initiated effective programs to control poison runoff. In many cases, these programs were developed to deal with a localized crisis of contamination. They can serve as models and be adapted by other areas to suit specific needs.

There are steps we can take right now to stop the spread of poison runoff. We need to pull back from the water's edge. There is abundant evidence that the damaging effects on water quality caused by activities like farming, logging, and grazing are greatly increased if they are allowed to occur right up to the riverbank or tidal zone. For example, manure piles from chicken farms in the Chesapeake Bay watershed located right next to the Bay's tributary streams cause bacteria and other contaminants to wash into the Bay and coastal waters. Similarly, plowing the soil right up to the edge of a stream causes the runoff of soil particles, chemical fertilizers, and pesticides into the stream and out into the coastal waters as soon as it rains.





We know that very simple changes in farming or animal management practices can greatly reduce these impacts. Leaving filter strips of undisturbed natural vegetation such as trees and grasses between the plowed field and the river or tidal wetland can provide excellent natural protection against agricultural runoff. Relocating the manure pile away from the water's edge and constructing a drainage and treatment system for runoff from the pile can eliminate the uncontrolled release of pollution from a chicken or dairy farming operation. Constructing fences along streambanks prevents cattle from grazing too close to the erodible bank.

Historically, these best management practices (BMP) have not been imposed upon farmers by federal, state, or local government officials. While voluntary cost sharing programs under which federal or state funds are given to farmers to subsidize the costs of implementing BMPs like creating filter strips or constructing manure management systems have been around for a long time, participation has not been widespread enough to protect water quality. The time has come to establish sensible controls on agricultural activities in all coastal watersheds threatened by poison runoff.

As with agriculture, urban and suburban activities that disturb land at the water's edge can and must be regulated to halt the decline of water quality. Because of the lucrative nature of coastal real estate, few coastal communities have adequate incentives to control growth. Local planning and zoning officials must re-orient their thinking to take water quality impacts from runoff into account. They must require that construction and earth-moving activities be conducted in ways that do not cause erosion. They also must require and enforce design standards that greatly reduce the amount of pavement that is installed along with new development.

We can also require coastal communities to treat poison runoff before it reaches our coastal waters. Though current federal law phases in treatment requirements, some communities will not be required to begin treatment until 1993, and some coastal areas may escape these poison runoff controls altogether. For some polluted waters, this is too little, too late.

Protect Clean Waters

We need to protect waters that are already clean. Since many coastal waters are badly polluted, there is a natural tendency to focus our efforts on cleanup. But some of our coastal waters are still relatively clean and as growth in the coastal region continues, these waters become threatened as well. It is equally important to make sure that these waters stay clean.

EPA and many states have antidegradation rules designed to keep clean waters clean. Typically, citizens can petition their states to designate clean and valuable waters for special protection. Often they are known as Outstanding Resource Waters; they include waters of parks and wildlife refuges, or other waters with special ecological or recreational value. Unfortunately, these rules have not been used frequently enough.

Citizens can spur this process on by insisting that their state have a strong antidegradation program and by petitioning the state to designate waters for special protection. Once designated, the state should make sure that these pristine waters stay clean by:

- prohibiting new or increased pollution discharges from factories and sewage plants
- stopping or imposing strict controls on new developments that will cause poison runoff
- purchasing or taking steps to protect important coastal habitats, such as valuable wetlands, that support these special protection waters.

Govern Coastal Development

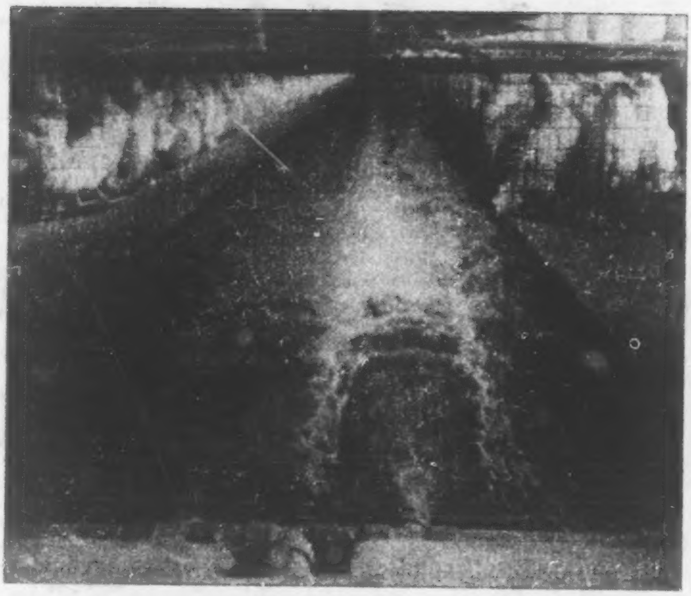
We need to limit the density of development allowed along the coastline and require that it be set back from the water. This will limit the amount of sewage, fertilizers, and other runoff that enters coastal waters. Examples of coastal development controls can be found on both sides of the continent. In response to the declining conditions in the Chesapeake Bay, for instance, Maryland established the Chesapeake Bay Critical Area Commission which limits the density of development along significant sections of bayfront to one dwelling per 20 acres. Under local coastal plans in several California counties, density limits for nearshore development along portions of the coast range from one unit per five acres to one unit per 640 acres, with an average of one unit per 20 to 40 acres.

Density restrictions are particularly important for areas with high water tables and porous soils since pollution can easily filter down into groundwater, thereby threatening drinking water supplies and coastal waters.

Setback requirements or buffer zones are another important way to limit the adverse effects of development. Rhode Island has adopted a setback of 200 feet for all new development along the perimeter of salt ponds in order to protect water quality. Such undisturbed buffers zones can check the flow of pollutants into coastal waters.

Another way to protect coastal waters is to require that any major development proposed along the coast, before being approved, first demonstrate that it will not degrade coastal water quality nor interfere with current uses of coastal waters (such as shellfishing). North Carolina's coastal program currently contains such a requirement.

Finally, requiring new developments to have effective stormwater management plans is an important tool for abating coastal pollution. Such plans should: 1) limit the amount of built-upon surface allowed as part of a project to a small percentage (e.g., no more than 15 percent of the site may be covered by man-caused impervious surfaces in certain coastal areas in Maryland);



A fast moving stream of water moves chicken manure quickly from a modern hen house into an anaerobic lagoon, thus reducing pollution problems by animal waste.

Frank Jeter, Jr. /USDA- Soil Conservation Service

2) limit site disturbance and rely on naturally occurring vegetation rather than expansive gardens and lawns which require the use of pesticides and fertilizers; and 3) require the use of retention/detention basins to control runoff from significant storms.

Subsidy Cut-offs. The Coastal Barrier Resources Act od 1982, which prohibits federal development subsidies for designated coastal barrier islands, beaches, and other features, provides an important model for protecting coastal areas from overdevelopment. Cutting off federal development subsidies does not halt development altogether but removes important incentives that encourage such development.

Federal subsidies for development that are banned for units in the Coastal Barrier Resources System (CBRS) include:

- insurance through the National Flood Insurance Program
- federal funding for roads, bridges, water lines, sewers, and other infrastructure
- federal grants and loans for housing.

Eliminating federal subsidies for building on barriers saves taxpayers' money and reduces the loss of life and property that results when flood-prone areas are developed. In addition, fragile coastal ecosystems and the abundant wildlife they support are protected from destructive building and pollution associated with coastal development.

Close to one-half million acres of coastal barriers are protected by the CBRS along the Atlantic and Gulf coasts. The U.S. Department of Interior, which administers the CBRS, has recommended that Congress add another 790,000 acres of undeveloped shoreline along these coasts, but has failed to recommend similar protection for barriers along the Great Lakes and West Coast. Inclusion of all eligible barriers, regardless of their location, would ensure that taxpayers do not subsidize hazardous, environmentally destructive development.

Congress will soon decide whether to adopt the Interior Deparment's recommendations to protect additional barriers by adding them to the CBRS. It makes good economic and environmental sense to expand the System and extend the approach to other sensitive areas.

Tax Policy. Federal, state, and local tax policy can provide powerful incentives and disincentives for coastal development. Legislatures have recognized the effectiveness of tax policy to protect the environment. Federal, state, and local tax laws, for example, contain provisions specifically designed to prevent undesirable practices in relation to agricultural and timber land.

While the Coastal Barrier Resources Act withdrew most federal financial assistance for development of units in the Coastal Barrier Resources System, it does not deal specifically with tax policy. Furthermore, under present law very few tax incentives or disincentives are directed to coastal conservation objectives. Accordingly, conservation takes a back seat to economic development.

Tax policies to promote coastal protection can be placed in two categories: those that would reduce incentives or provide disincentives to develop coastal regions, and those that would increase incentives to conserve coastal regions.

Federal tax policies to inhibit development in the CBRS and other sensitive coastal areas should eliminate or limit deductions for casualty and other losses and for expenses of development, including supporting facilities; eliminate use of tax-exempt state and local bonds to finance private development activities; and eliminate the favorable tax treatment for investment and development accorded to real estate investment trusts and real estate mortgage investment conduits. All of these measures would significantly reduce the profitability of development while increasing federal tax revenues.

The Tax Reform Act of 1986 eliminated several key provisions of the Internal Revenue Code that had encouraged property development, including the investment tax credit, accelerated depreciation for real property, and preferential taxation of capital gains. Although not specifically directed toward environmental concerns, these changes have helped to inhibit development of coastal areas. Legislative proposals have since been made to reverse certain aspects of the changes. One of the most serious now pending is President Bush's proposal to restore preferential tax rates for certain capital gains. The restoration of such preferential rates, if applicable to real property, would add significantly to pressures for land transactions, leading to higher prices and encouraging speculation in sensitive coastal areas. All such proposals must be resisted unless revised to exclude application within the CBRS and other sensitive coastal areas.

Tax policies to encourage conservation in the CBRS and other coastal areas should include state and local taxation of properties withheld from development based on their value as used, or on some other reduced basis, rather than their higher development value, with the federal government reimbursing in part the lost tax revenues. In addition, federal tax policy should be designed to encourage the gift or sale of land or development rights in land for conservation purposes.

Important environmental protection for sensitive coastal areas can be provided by programs for the purchase by governmental agencies or non-government conservation organizations of land or development rights in land. Federal, state, and local programs should be fostered by dedicating specified tax revenues to that purpose or permitting use of the proceeds of tax-exempt bonds. A number of states already have programs for coastal acquisition from the proceeds of some form of real estate development tax. Maryland's Program Open Space is a good example. It uses a fixed annual sum from land transfer tax revenues for the purchase of development rights and land for open space purposes. Recent bills in Congress have proposed the dedication of specific revenues to purchase open space and for grants to state and local governments to acquire land or development rights.

Minimize Dredged Spoils

We need to minimize the harm associated with the dumping of dredged materials. There are four principal ways. First, improve the tests for toxicity done on the dredged spoil. While EPA requires some testing, not enough of the material to be dumped is actually tested. Furthermore, the tests used are out of date, providing much less useful information than the current state of the art allows.

Second, we must cease disposing hazardous dredged material in the oceans entirely. Dredged materials that meet the standards for hazardous waste should be disposed of in facilities on land that meet EPA hazardous waste facility criteria.

Third, we have to minimize the amount of toxic materials going into dredged sediments. This can be done by reducing the discharge of such toxic substances as oil in harbors and by reducing the pesticide runoff into streams.

Fourth, we should dispose of all nontoxic dredged materials at safe ocean sites. Under federal law, EPA has the duty to designate dumpsites. It should choose sites beyond the continental shelf wherever feasible. Because the richest concentrations of marine life are on the continental shelf, disposal of material in the deeper waters off the shelf is less disruptive to the environment.

Avert Oil Spills/Restrict Offshore Drilling

We need to avert another disaster such as the *Exxon Valdez* oil spill and the three spills in June 1989 along the East and Gulf coasts from occurring. We must take decisive steps now to revise our domestic energy program, permanently protect sensitive areas, and tighten environmental safeguards on the oil industry's operations.

The most pressing need is to place the most sensitive environmental areas off-limits to oil activity. It would be inexcusable to expose such areas as Alaska's Arctic National Wildlife Refuge and Bristol Bay fishery, the Florida Keys, New England's Georges Bank fishery, and sensitive areas of the Pacific and mid-Atlantic coasts to an ecological disaster like the Valdez spill.

To replace the oil and gas thought to underlie these sensitive areas, we must also renew our commitment to conservation and alternative energy sources. These will enhance long-term energy security and carry far fewer environmental risks than the exploration, transport, and burning of fossil fuels.

How realistic is conservation as an alternative to oil exploration and development? An NRDC analysis recently identified an energy conservation resource more than twice as large as the total predicted oil production from sensitive offshore and Alaska lands, based on efficiency improvements in homes, appliances, and vehicles. Merely improving the efficiency of existing oil and gas furnaces and water heaters to the fullest cost-efficient extent would save the equivalent of 4.5 billion barrels of oil. This is roughly the same amount of oil that is believed to be contained in all the most sensitive areas. Moreover, aggressive weatherization programs for America's 53 million oil and gas heated homes would save twice the oil believed to be in these areas. Finally, an increase in fuel efficiency of cars to 40 miles per gallon and of trucks to 30 miles per gallon by the year 2008 would save more than three times the amount of oil.

The oil industry has long told us that the risk of a catastrophic spill is so slight that we need not worry about it. It is now tragically clear how wrong the oil industry is. Simply declaring that "it can't happen here" is no longer an adequate safeguard for our most precious lands and waters. We must also take greater precautions to prevent an oil spill in those areas that are already subject to oil activity. Standards for vessel design should be strengthened to require the use of double hulls, and the Coast Guard should be mandated to independently check vessel pilots' qualifications.

Financial incentives for the oil industry to operate safely must also be dramatically increased. This can be accomplished by raising liability limits for spill damages, revising the tax code so that spill cleanup costs are not deductible from company income taxes, and preventing the industry from passing on cleanup costs to consumers and profiting from a spill through higher oil prices.

Finally, the response of industry and the government to oil spills needs an overhaul. Contingency plans should be reviewed and revised in light of the recent disasters. Detailed and workable procedures must be developed for responding to the maximum potential spill. Sufficient cleanup equipment and personnel must be maintained in constant readiness. A sizeable fund, financed by a fee on industry, should be made available to the government so it can promptly mount an effective cleanup operation when large spills occur.

Create Ocean Sanctuaries

We need to create lasting protection for sensitive ocean areas. One way would be to designate them as special areas and give them specific protective rights. That is the goal of the ocean sanctuary concept. It has evolved over the last few years out of frustration with the federal government's push to produce oil and gas and drill for minerals on the seafloor that would degrade our remaining pristine marine environments.

Ocean sanctuary would protect the integrity of the entire marine environment in a designated area by permitting harvest of renewable food resources, such as fish and marine vegetables, but prohibiting the extraction of fossil fuels, minerals, and other nonrenewable resources. Dumping and burning toxic or other harmful wastes in sanctuary areas would be prohibited, too, as would the transport of any such materials through sanctuary areas.

Although the ocean sanctuary concept has potentially broad application, currently the only active proposal is a bill introduced in Congress to designate a sanctuary off the coast of California. Legislators and activists from other threatened areas such as Florida, Alaska, and New England have begun a movement to designate these as "Wilderness Areas in the Sea."

Control Medical Waste

We need to keep better track of the disposal of medical waste to make sure it doesn't wash up onshore and threaten human health. In response to public outrage over last summer's beach closures due to medical waste, Congress moved with unusual speed in enacting legislation directing EPA to track medical waste and prohibiting its ocean disposal. A two-year demonstration program, the Medical Waste Tracking Act of 1988 represents a modest beginning in the effort to ensure minimum, uniform federal requirements for managing medical waste. In addition to addressing the public health concerns, the statute recognizes the aesthetic and environmental values violated by medical waste washups.

The cornerstone of the Act is the es-

Richard Frieman

tablishment of a tracking program and a manifest system for wastes moving offsite for treatment and disposal. Congress also amended the Clean Water and Ocean Dumping Acts to prohibit the ocean disposal of medical waste and enacted the United States Public Vessel Medical Waste Anti-Dumping Act to restrict dumping by public vessels to very limited circumstances such as war.

The Medical Waste Tracking Act is not a panacea, however. It has a number of weaknesses, the most significant being that it covers only seven states and territories, including New York, New Jersey, Connecticut, Rhode Island, Louisiana, Puerto Rico, and the District of Columbia. The system must be extended to all 50 states because the problem is national in scope. In fact, Michigan and Pennsylvania are experiencing medical waste washups in 1989 even though the states chose not to be a part of the federal tracking system. Additionally, the Act does not address the four principal treatment and disposal practices for medical waste: incineration, steam sterilization, landfilling, and sewage disposal. The statute only requires EPA to study these practices. These activities could, however, pose other, possibly more serious threats to human health and could contribute to the further degradation of coastal areas and waters if left unregulated.

While the tracking rules will help to control the disposal of medical waste, they won't prevent all waste from washing ashore. NRDC believes many aspects of the regulations are deficient and significant sources of floatable waste remain unabated. Clearly, the tracking measures under the Medical Waste Tracking Act are only the first step in bringing medical waste under comprehensive controls. NRDC believes the information gained from the demonstration program under the new Act should be used to institute a permanent national program. Second, the federal government should establish comprehensive operating regulations for medical waste treatment technologies, especially for incinerator air emissions and ash management. Third, sewer disposal of medical waste should be prohibited outright. Discharging medical waste into the sewer system is already prohibited in Switzerland, Sweden, and West Germany.

The problem of medical waste draws attention to the need to control other forms of floatable waste, including plastics. We need to establish and enforce programs to prevent plastics from reaching the ocean. An annex to the International Convention for the Prevention of Pollution from Ships (known as MARPOL) regulates the release of plastics (e.g., garbage bags, synthetic ropes and fishing nets) from sea-going vessels. This annex has been ratified by Congress as the Marine Plastic Pollution Research and Control Act of 1987. Ratification is an important first step to reducing the plastic pollution in our coastal waters. Now the authorities must rigorously enforce the new law.

Federal legislation is also needed to phase out the use of nondegradable fishing lines and nets and to replace them with natural fibers or other degradable materials. Most importantly, Congress must act to reduce the amount of plastics and nondegradable materials that our society uses and, and at the same time, create incentives for recycling these materials. Municipalities and states should enact bans on the use of plastics and foams. Environmental groups and citizens should call on manufacturers to use biodegradable packaging for their products.

Dispose Household Hazardous Waste Properly

We need to stop improper disposal of household hazardous wastes such as used oil, cleaning solvents, and batteries. Frequently, they are poured down the drain or disposed of as household trash. This practice poses serious environmental consequences.

Liquid wastes poured down the drain end up in sewage treatment plants that are not always capable of treating such contaminants. Groundwater contamination can occur when household toxics are disposed of in ordinary landfills. Introduction of these hazardous materials into incinerators can cause boiler explosions, toxic air emissions, and contaminated ash.

We need a national program to coordinate and control the collection and separation of household hazardous wastes. Currently no such program exists. While some efforts are being made at state and local levels to control these wastes, most are only one-day events. They are often inadequate. A formalized national program would help protect coastal waters.

NRDC'S PLAN TO END COASTAL POLLUTION

Frans Lanting

We cannot repair the damage caused by coastal pollution overnight. However, we can take steps immediately to turn the tide on coastal pollution. With persistence, we can bring back our coastal waters to the point where they are safe for fishing, swimming, and marine life.

Here is NRDC's program to battle coastal pollution. Some of these steps address short-term health threats and pollution concerns, while others are designed to restore and maintain the long-term health of our coastal waters. If all of these steps are started immediately, within five years we should see a reversal of the decline in coastal waters and, within another five years, significant restoration of our coastal waters.

It is noteworthy that several of these steps are included in coastal protection legislation pending in Congress. This legislation will pass only with strong expressions of public support.

Toxics

- Impose strict new nationwide pollution control requirements for industries that currently pollute coastal and inland waters, either directly or through public sewers. These rules should cover all industries and all dangerous pollutants, and should prohibit discharges altogether where technologies such as wastewater recycling are available.
- Require companies to find new ways of doing business without polluting by: producing factory goods using fewer toxic chemicals and making more efficient use of water and materials; reducing the quantity of material entering municipal waste landfills through packaging reduction and materials recycling.
- Prohibit new or increased coastal discharges of factory pollution that would cause or contribute to a violation of water quality standards.
- Institute a nationwide program to collect and safely dispose of household hazardous wastes.
- Enforce current laws and regulations designed to control toxic factory pollution.

Sewage

- Eliminate all discharges of raw sewage from combined sewer overflows.
- Upgrade all existing coastal sewage plants to at least the degree required for inland waters (secondary treatment) or even stricter levels where needed to solve local water quality problems.
- Prohibit new or increased coastal discharges of pollution from sewage plants that would cause or contribute to a violation of water quality standards.
- Strengthen pretreatment programs to reduce the discharge of toxic pollutants into sewage treatment plants.
- End ocean dumping of sewage sludge and utilize environmentally acceptable land-based alternatives.

- Promote the use of water conservation devices in industry and the home in order to reduce the flow to sewage treatment plants and hence the danger of overflow.

Coastal Development

- Develop programs to pull back from the water's edge by:

— requiring land use plans, zoning ordinances, and coastal zone management plans to protect water quality and to limit the density of coastal development;

— requiring filter strips and buffer zones between new developments and coastal water bodies, including rivers and estuaries;

—increasing public purchases of sensitive coastal lands;

— eliminating subsidies and tax incentives that encourage coastal development, and replace them with tax and other incentives to preserve coastal habitat; and

— avoiding any development in coastal wetlands.

Poison Runoff

- Require strict, enforceable plans to reduce poison runoff from existing development and prevent poison runoff from new development. Comprehensive plans to control polluted urban runoff (stormwater) should be developed for all coastal counties. Farmers, developers, and other land users who cause poison runoff should be required to use buffer strips, runoff controls, integrated pest management, and other practices designed to prevent poison runoff.

Oil Spills

- Institute a comprehensive national program to protect coastal waters from oil spills by:

— aggressively pursuing a new national energy policy based on energy efficiency and renewable energy resources, to reduce our dependence on oil;

— keeping sensitive offshore and nearshore areas, such as Bristol Bay in Alaska, portions of the Pacific and Mid-Atlantic Coasts, the Florida Keys, and Georges Bank off Massachusetts, closed to oil development;

— passing laws that require those responsible for oil spills to pay the full costs of cleanup and restoration, and full damages to all injured parties, including damages for lost public resources;

—preventing oil spills through improved tanker design and construction, and improved navigation and licensing requirements for tanker operation;

— improving oil spill cleanup capabilities through improved planning, increased personnel training, more and better cleanup equipment, and dramatically increased research and development of cleanup technologies; and

— routing tankers as far as possible from sensitive coastal areas.

Medical Waste

- Stop all ocean dumping of medical waste, both directly and through public sewers.
- Adopt a nationwide tracking program to ensure that medical waste is safely disposed of.

Plastics

- Prevent the discharge of plastics from vessels, sewers, and other sources.
- Reduce the utilization of disposable plastics.

Dredged Spoils

- Prohibit ocean disposal of hazardous dredged spoils.
- Implement new programs to reduce the toxicity of dredged spoils.

Long-term Protection

- Protect sensitive marine areas as ocean sanctuaries.
- Adopt strict, new water quality standards that are designed to protect coastal habitats, fish, shellfish, and wildlife. Supplement these with standards which set pollutant limits in sediments, fish, and wildlife. Require that these new standards are met by all coastal dischargers and developers.
- Designate currently clean waters for special protection to make sure they stay clean.

5 WHAT YOU CAN DO TO STOP POLLUTION

Left: Planting American beach grass can help stabilize sand dunes and prevent erosion. Photo by Richard N. Duncan / USDA-Soil Conservation Service

Steps You Can Take at Home

1. Use phosphate-free, low phosphate or biodegradable dishwashing liquid, laundry detergent, and shampoo.

   Algal growth is stimulated in phosphate-rich water. The result is eutrophication. For many water organisms this has devastating side effects. Fish and other animals suffocate because of the lack of oxygen.

2. Use natural fertilizers such as manure or compost on your garden. Landscape with natural vegetation rather than lawns that require fertilizers and pesticides.

   Through poison runoff, herbicides and pesticides eventually reach water where they can kill aquatic life.

3. Dispose of household hazardous and medical wastes properly. Do not pour paint, turpentine, petroleum-based oils, or solvents down any drain. Do not flush hypodermic needles down the toilet.

   These chemicals poison all water life. If you purchase them, read the label. Know what you are buying and what the potential hazards are. Use alternative, less harmful products whenever possible.

   Pour liquids such as cleaning fluids into a plastic container that is filled with kitty litter and allow it to dry outdoors before taking it to the landfill. Recycle old motor oil and antifreeze at a gas station that has an oil recycling program.

   Encourage your local Department of Health to organize a Household Toxics Collection Day on which hazardous wastes will be taken to a specialized dump site.

4. Do not use water fresheners in your toilet.

   Water fresheners are synthetic perfumes and colors. These poison the sewage treatment process.

5. Maintain your septic system so it will function properly and not contribute to groundwater contamination.

   Nearly 24 percent of all homes in the U.S. are served by septic systems. By following proper maintenance practices, you can keep your system running smoothly for years. Monitor your tank yearly and have a reputable contractor remove sludge and scum every three to five years in order to prevent solids from escaping the absorption system.

6. Improve the drainage around your home and in your yard.

   Improving drainage can help reduce surface runoff, prevent erosion, and protect coastal waters. Rainwater runs downhill, some filtering through the soil, some running directly into nearby streams. By designing your homesite correctly, you can encourage rainwater to move slowly across the soil so most of it filters into the ground. Install gravel trenches along driveways or patios to allow water from your drain spouts to seep into the soil slowly. This will collect water and allow it to filter into the soil.

7. Landscape with permeable surfaces.

   Solid surfaces such as concrete do not absorb moisture and increase surface runoff and spreading poisons to drainage systems. Use crushed rocks, gravel, or bricks laid in sand, not mortar. Preserve the established trees in your yard. They help minimize the damage caused by surface runoff. Plant appropriate shrubs and trees for the soil in your yard. Don't select vegetation that needs lots of watering. This increases runoff. Don't overwater.

8. Set your house back from the water's edge.

   Sewage and runoff impacts are minimized by locating houses away from the water.

9. Avoid using and disposing of plastics and styrofoam. When you do use these products, recycle them.

10. Conserve water whenever and wherever possible.

    Install water-conserving fixtures at home such as low-flow toilets that use only one gallon of water when flushed, instead of the usual five or more gallons; faucets; aerators; and showerheads. Extra water overwhelms sewage treatment plants and contributes to overflows.

    Check for leaks. A dripping faucet can waste up to 20 gallons of water every day. A leaking toilet can waste 200 gallons a day.

    Run your dishwasher and washing machine only when you have full loads. Don't run water continuously when washing dishes in the sink or while shaving or brushing your teeth. Water your lawn and wash your car only when absolutely necessary. When you do wash your car, rinse quickly. Use a hose that is high pressure, low volume, and has a controllable nozzle.

11. Be a responsible boater. Discharge boat sewage into onshore sanitary facilities and not into coastal waters. Don't dump trash overboard.

Steps You Can Take as a Consumer

1. Boycott persistent polluters.

   Identify sources of pollution and exercise your power as a consumer by not buying products from irresponsible polluters. Inform them of your decision. Encourage others to do the same.

2. Buy organically grown produce.

   Nitrates, an important component of artificial fertilizer often used in large-scale agriculture, seep into groundwater and poison our drinking water supply. Nitrates impair circulation to the brain and are a cancer risk. Moreover, pesticides and herbicides may cause cancer and birth defects. Tell your grocer of your preference. Encourage the store to stock organic produce.

3. Demand to know where the fish you buy is from and avoid fish caught in polluted coastal areas. Tell your grocer of your decision.

4. Do not buy or use anti-fouling marine paints that contain organotins.

5. Avoid using nonbiodegradable plastic bags at home and at the supermarket. Ask the store manager to supply paper bags or bags made of biodegradable plastic.

6. Buy fuel-efficient cars, weatherize your home, and improve the efficiency of your furnace or water-heater.

   The less oil that is used, the less pressure there will be to drill for oil in sensitive coastal areas such as Bristol Bay, the California Coast, Georges Bank, the Florida Keys, Washington, Oregon, and the Mid-Atlantic. This will also lessen the need to transport oil via tanker, thereby reducing the likelihood of oil spills such as the *Exxon Valdez*.

Land Use Activists

Citizen groups around the country are taking a more active role in lobbying for tighter coastal development laws. In California's Monterey County, for example, citizen action was instrumental in an effective campaign to limit construction in sensitive resource areas along the rugged Big Sur coast. The activists based their arguments for protection of coastal resource areas on the need to maintain the valuable habitats they provide. Local officials responded to the public's demand by establishing density standards of one unit for every 40 to 320 acres, depending on the steepness of the site's slope. The plan puts all wetlands, lagoons, indigenous dune plant habitats, and nearshore reefs, off limits to development.

Monterey County is not the only California area where local plans call for low-density coastal development. In the rural areas of Santa Barbara, San Luis Obispo, San Mateo, Marin, Sonoma, and Mendocino counties, the density for nearshore development ranges from one unit per five acres to one unit per 640 acres, with an average of one unit per 20 to 40 acres.

Chris Colwell

Steps You Can Take as a Citizen

1. Join a civic organization, coastal advocacy group, or other community group that is involved in efforts to preserve and restore the coast. If none exists, form one and encourage others to join.
2. Let your elected officials know how you and your community feel about the quality of life around the coast.

   Inform them of your concerns about the devastating effects of industrial and governmental indifference to coastal water pollution and ask them to take aggressive action to reverse these effects. Let your congressional representatives know of your interest in coastal protection legislation currently pending in Congress.
3. Adopt your local waterbody.

   Get to know the water you seek to protect either as an individual or as a member of a group. Find out the water quality by contacting the local Water Quality Control Board or EPA. Walk its banks, identify the sources of pollution, and push for tighter controls.

   If your waterbody's quality is not governed by a plan, contact your elected officials and get their help in supporting preparation of one. If there is a plan in place, monitor whether or not dischargers are in compliance with it. Lobby and litigate for compliance. Start in on cleanup and restoration.
4. Support strong land use planning.

   Lobby your local government or state coastal management agency to adopt land use planning policies that reduce the amount of development allowed along the coast and along streams and wetlands. Support measures that require developers to leave a percentage of mature trees standing when excavating for new developments.

   Land use controls can also help limit coastal pollution by directing development away from hillsides and areas prone to erosion in coastal watersheds. Construction activities disturb topsoil and produce runoff that results in increased sediment loads in coastal streams. These increased loads lead to rapid sedimentation in lagoons and wetlands.

Whistle-blowers of the Waterways

Citizens living near San Francisco Bay, the Long Island Sound, and the Hudson River have formed organizations as formal watchdog systems to protect their local waterways. The groups rely on individual volunteers and sometimes even paid staff to patrol the adopted waterways, report polluters, organize citizen support for strict pollution laws, and generally highlight the need for vigilance to keep the coastal waters healthy and clean. The Hudson River Keeper organization, for example, began by literally walking the river's banks and recording all outfalls into the river. Then, members checked with the state water agency and EPA to determine if the pollution sources were legally permitted. They reported those that weren't and supported tighter restrictions on those that were.